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WATER BULLETIN NUMBER 29

Flow of the Rio Grande and Related Data

*From Elephant Butte Dam, New Mexico
to the Gulf of Mexico*

1959

STORAGE IN MAJOR RESERVOIRS
SOURCES OF RIVER FLOW
DIVERSIONS
SUSPENDED SILT
CHEMICAL ANALYSES
SANITARY ASPECTS OF WATER QUALITY
METEOROLOGIC DATA
DRAINAGE BASIN AND IRRIGATED AREAS

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FOREWORD

This bulletin presents the twenty-ninth compilation of the stream discharges and related data concerning the international portion of the Rio Grande, prepared jointly by the United States and Mexican Sections of the International Boundary and Water Commission. The stream flow data and kindred subjects pertain to the Rio Grande and its important tributaries near their confluence with the main stream from Elephant Butte, New Mexico to the Gulf of Mexico. The first publication in the series was Water Bulletin No. 1 for the year 1931. The present volume contains the information for the year 1959.

International stream gaging on the Rio Grande was initiated in 1889, when the station at El Paso, Texas was established. Several stations on the Rio Grande and its tributaries downstream from El Paso were established in 1900 and operated until 1914. Between 1914 and 1923, except for a few months in 1919 and 1920, all stream-gaging work on the international reach of the river was suspended. In 1923, the work was resumed and carried on independently by the two countries until 1931, when the present joint program of stream measurements was adopted.

During 1959, the United States Section of the Commission operated the stream-gaging stations on the Rio Grande at El Paso, American Dam, Island, County Line, Fort Quitman, Upper Presidio, Lower Presidio, Johnson Ranch, Langtry, Below Amistad Dam Site, San Antonio Crossing, Fort Ringgold, San Benito, and Lower Brownsville. The Mexican Section operated the stream-gaging stations on the main stream at Below Maverick Dam, Eagle Pass, Palafox, Laredo, Below Anzaldas Dam, and Progreso. The station at Falcón Dam was operated jointly by the two sections. Each Section operated the gaging stations on tributary streams, floodways, and diversions within its own country.

The total drainage area within the outer rim of the Rio Grande Basin is 335,500 square miles. However, nearly half of this area yields no runoff to the river, the estimated productive area of the watershed being 182,215 square miles. Reservoirs in the basin have a total storage capacity of approximately 8,700,000 acre-feet, in addition to the International Falcón Reservoir, which has a conservation capacity of 2,400,000 acre-feet. A present rounded total of 2,162,000 acres is irrigated below Elephant Butte Dam on the Rio Grande and below Girvin on the Pecos River. The residual flow from the Rio Grande that escaped to the Gulf of Mexico prior to construction of Falcón Dam averaged 2,600,000 acre-feet per year for the period 1934-1952. For the period 1953-1959, the residual flow has averaged 568,000 acre-feet per year.

Acknowledgments

Other agencies which have contributed to some part of the data published herein include: The Agricultural Research Service, the Soil Conservation Service of the U. S. Department of Agriculture; the Bureau of Reclamation and the Geological Survey of the U. S. Department of the Interior; the Weather Bureau of the U. S. Department of Commerce; the Texas Board of Health; the Colorado State Engineer; the New Mexico State Engineer; the Red Bluff Water Power Control District; the Willacy County Water Control and Improvement District No. 1; the El Paso Department of Water and Sewerage; the Maverick County Water Control and Improvement District No. 1; the Laredo City Water Department; the Special Water Master of the 93rd District Court of Texas; the Ministry of Hydraulic Resources of Mexico; the Meteorological Service of Mexico; Northern Electric Power Company of Mexico, S. A.; the Federal Board of Public Improvement Works of Nuevo Laredo, Tamaulipas and the Water and Drainage Board of Matamoros, Tamaulipas.

Additional contributions have been made by individuals and corporations and specific notation is made for such, as well as for those of the above named agencies, where the data appear. The courtesy and cooperation of those who made these contributions are acknowledged with our appreciation.

Units of Measure

Data collected by the Mexican Section are initially computed in metric units but are reported in this Bulletin in English units. The monthly volumes of stream-flow in cubic meters reported by the Mexican Section are converted to acre-feet by multiplying thousands of cubic meters by 0.81071 and rounding the result.

GENERAL HYDROLOGIC CONDITIONS FOR 1959

Along and Adjacent to the International Portion of the Rio Grande

During the year 1959, temperatures were 99% of normal on the watershed of the Rio Grande below El Paso, Texas. Evaporation averaged 90% of normal. Precipitation was equal to normal from El Paso to Amistad Dam Site, 94% of normal from Amistad Dam Site to Falcón Dam, 79% of normal from Falcón Dam to Rio Grande City, and 83% of normal in the lower Rio Grande Valley on the United States side.

The yearly volume of flow of the Rio Grande was below normal from El Paso, Texas to Falcón Dam, ranging from 3% of normal at County Line Station to 85% of normal at Laredo Station. All flows passing Rio Grande gaging stations below Falcón Dam were partly regulated by releases from Falcón Reservoir. Such releases in 1959 equalled the average for the seven years of operation.

The total annual flow of all measured tributaries below Fort Quitman was 71% of normal. The total flow of these tributaries in the United States was 1,079,400 acre-feet or 109% of normal. For Mexico, the measured tributary flow, excluding Río Alamo and Río San Juan, was 1,079,000 acre-feet or 72% of normal.

Return flow to the Rio Grande at Maverick Power Plant near Eagle Pass was 688,600 acre-feet or 127% of the 11 year average. The return flow of 918,600 acre-feet at Poniente Drain consisted largely of Rio Grande water by-passed to facilitate construction of Anzaldas Dam.

No floods of consequence occurred on the Rio Grande in 1959. On October 5, a peak flow of 64,200 second-feet at Below Amistad Dam Site Station was the highest recorded in 1959. No flood damage occurred.

For all reservoirs in the Rio Grande basin having capacity greater than 15,000 acre-feet, excepting Bluewater Reservoir in New Mexico and Falcón International Reservoir, the average amount of water in storage in 1959 was 5,321,400 acre-feet or 144% of the normal 3,704,300 acre-feet. In the United States, stored water in these reservoirs averaged 86% of normal while in Mexico the average was 175% of normal. There was a decrease in storage of 239,200 acre-feet in International Falcón Reservoir. Storage varied from a high of 2,960,100 acre-feet on January 15 to a low of 2,191,800 acre-feet on June 24 and averaged 2,523,400 acre-feet during the year or 182% of the average for the seven years of operation.

Diversions from the Rio Grande in the United States were, on the average, 116% of normal. Diversions into the American Canal were 98% of normal; into Maverick Canal 114% of normal; and in the United States below Fort Ringgold 124% of normal. In Mexico, diversions average 83% of normal. Diversions into the Acequia Madre were 121% of normal while diversions through the Anzaldas Canal for irrigation in Mexico were 80% of the eight-year average.

In 1959, the total reported irrigated acreage from the Rio Grande and its tributaries below El Paso, Texas showed an increase of 1% from the previous year. Overall, there was practically no change in the United States and an increase of 38% in Mexico. On the United States side, there was a decrease of less than 1% above Falcón Dam and an increase of less than 1% from Falcón Dam to the Gulf. On the Mexican side, there was a 22% increase above Falcón Dam and a 48% increase below.

The 1959 investigation of the quality of Rio Grande water extended from El Paso to Lower Brownsville. The annual tonnage of salts carried by the river above Falcón Dam was 73% of the 1935-1959 normal. The volume of suspended silt transported by the Rio Grande in 1959 was 61% of the normal for sampling stations above Falcón Dam.

RIO GRANDE BELOW ELEPHANT BUTTE DAM, NEW MEXICO

DESCRIPTION: Water-stage recorder, 3,800 feet below Elephant Butte Dam, and cable with sit-down cable car and winch 100 feet below the recorder. Elephant Butte Dam is 135.1 river miles above the American Dam at El Paso, Texas. The zero of the gage is 4,242.09 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 34 current meter measurements during the year and a continuous record of gage heights. Records, marked "Subject to Revision", were furnished by the United States Geological Survey. Records available: January 1915 through December 1959.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. Beginning December 1940, hydroelectric power generation facilities for 27,000 kva were placed in operation at Elephant Butte Dam.

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet

Daily:	Max. 8,220	May 22, 1942	Min. 0	Occasionally
Monthly:	Max. 7,600	May 1942	Min. 2.7	Sept. 1954
Yearly:	Max. 2,510	1942	Min. 293	1955

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	558	1,040	1,240	936	660	1,160	2,080	1,870	664	742	10,0	8.8
2	551	1,130	1,270	950	660	1,160	2,080	1,870	684	751	10,0	8.8
3	565	1,070	1,280	939	664	1,160	2,080	1,880	687	741	9.4	8.8
4	565	1,120	1,280	950	671	1,150	2,080	1,880	668	730	9.4	8.8
5	591	1,090	1,270	946	671	1,170	2,070	1,870	644	726	8.8	8.8
6	580	1,110	1,240	947	667	1,160	2,080	1,870	637	720	8.8	8.8
7	591	1,090	1,280	946	675	1,150	2,080	1,860	634	714	8.8	8.8
8	573	1,140	1,280	937	664	1,170	2,080	1,860	630	719	8.8	8.8
9	573	1,120	1,280	932	671	1,160	2,080	1,870	630	215	8.8	8.8
10	580	1,110	1,330	920	675	1,160	2,080	1,840	626	123	8.8	8.8
11	562	1,110	1,300	909	671	1,170	2,080	1,840	618	119	8.8	8.8
12	565	1,110	1,290	898	671	1,170	2,080	1,840	619	123	49.0	8.8
13	555	1,120	1,310	909	660	1,160	2,080	1,890	616	121	11.0	8.8
14	580	1,070	1,290	909	656	1,160	2,080	1,820	634	121	11.0	9.4
15	573	1,140	1,280	913	660	1,170	2,080	1,050	643	123	10.0	9.4
16	573	1,140	1,320	888	660	1,170	2,070	1,000	651	125	10.0	9.4
17	573	1,110	966	935	652	1,180	2,080	1,000	690	119	9.4	9.4
18	569	1,140	800	909	667	1,180	2,070	990	689	116	10.0	9.4
19	602	1,140	967	910	667	1,170	2,060	1,030	700	125	9.4	9.4
20	1,150	1,150	1,300	903	660	1,180	2,050	1,020	689	127	8.8	8.8
21	1,140	1,180	1,310	907	656	1,180	2,040	734	626	125	8.8	8.2
22	1,080	1,150	1,300	911	652	1,180	2,040	730	701	127	8.8	8.2
23	1,110	1,160	1,320	951	660	1,190	2,050	721	721	125	8.8	8.2
24	1,090	1,120	1,300	909	660	1,190	2,040	732	720	123	8.2	8.2
25	1,110	1,140	1,300	945	683	1,190	2,050	755	722	52.0	8.2	8.2
26	1,110	1,130	1,300	925	660	1,170	2,050	732	724	14.0	8.2	8.8
27	666	1,120	1,320	926	660	1,180	2,040	701	729	11.0	8.2	8.8
28	1,190	1,120	1,320	935	664	1,160	2,020	684	678	10.0	8.2	9.4
29	1,140		1,310	928	656	1,490	2,040	652	695	11.0	8.8	9.4
30	1,180		1,310	927	660	2,060	2,030	640	733	11.0	8.8	9.4
31	1,150		1,340	664			2,040	681		11.0		9.4
Sum	31,370	27,750	36,300		38,712			8,020.0		275.8		
	23,995	39,003	20,577		63,960			20,102		314.0		

Current Year 1959

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Period 1924-1959		
			High Day	Low Day			Average	Maximum	Minimum
	High	Low			Acre-Feet				
Jan.			28	1,190	2 551	47,600	25,836	86,500	184
Feb.			21	1,180	1 1,040	1,120	62,200	83,600	188
Mar.			31	1,340	18 800	1,260	77,400	62,701	1,520
Apr.			23	951	16 888	925	55,000	90,127	24,000
May			25	683	† 17 652	664	40,800	90,286	512
June			30	2,060	† 4 1,150	1,210	72,000	104,381	363,000
July			† 1	2,080	28 2,020	2,060	127,000	105,889	211,000
Aug.			† 3	1,880	30 640	1,250	76,800	95,276	42,200
Sept.			30	733	13 616	670	39,900	56,510	9,530
Oct.			2	751	28 10.0	259	15,900	24,422	163
Nov.			12	49.0	† 24 8.2	10.5	623	23,078	129,000
Dec.			† 14	9.4	† 21 8.2	8.9	547	23,144	121,333
Yearly				2,080		8.2	851	615,770	1,818,800

† And other days Ø Mean daily

RIO GRANDE BELOW CABALLO DAM, NEW MEXICO

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located .8 river mile below Caballo Dam, and 106.8 river miles above the American Dam at El Paso, Texas. The zero of the gage is 4,140.90 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 132 meter measurements during the year and a continuous record of gage heights. Records were furnished by the El Paso office of the United States Bureau of Reclamation. Records available: January 1938 through December 1959.

REMARKS: Reservoirs, diversions and drainage returns modify the river flow at this station. In addition to the outflow from Caballo Dam listed below, 1,220 acre-feet of water were diverted in 1959 into Bonita Lateral, a small irrigation canal just below Caballo Dam. Prior to 1938, discharge records were kept at Percha Dam, a low diversion dam about 1.5 miles downstream from this station. Small accretions to the river take place between this station and Percha Dam.

EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet

Daily:	Max. 7,650	May 20, 1942	Min. .1	Oct. 31-Nov. 14, 1954;
Monthly:	Max. 6,710	May 1942	Min. .1	Nov. 7-Dec. 31, 1955.
Yearly:	Max. 2,480	1942	Min. 303	Nov. & Dec. 1955 1955

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.1	3.6	8.0	1,940	1,610	1,740	1,820	2,200	*1,810	1.2	1.4	1.1
2	3.1	3.7	802	1,800	1,340	1,740	1,770	2,210	2,030	1.3	1.4	1.1
3	3.1	3.9	1,360	1,780	1,260	1,730	1,690	2,160	2,240	1.3	1.4	1.1
4	3.1	4.0	1,390	1,680	1,140	1,700	1,620	2,130	2,620	1.2	1.4	1.1
5	3.1	4.1	1,390	1,570	1,090	1,660	1,610	2,310	2,680	1.2	1.3	1.1
6	3.1	4.1	1,380	1,540	1,090	1,560	1,610	2,360	2,520	1.2	1.3	1.1
7	3.1	4.2	1,440	1,410	1,090	1,500	1,800	2,250	2,200	1.2	1.3	1.1
8	3.1	4.3	1,750	1,240	1,130	1,500	2,140	2,200	2,130	1.2	1.3	1.2
9	3.1	4.4	1,980	1,240	1,180	1,670	2,260	2,170	1,940	1.2	1.3	1.2
10	3.1	4.4	1,960	1,170	1,180	1,900	2,200	1,870	*1,800	1.2	1.3	1.2
11	3.1	4.4	2,060	1,040	1,190	1,940	2,210	1,670	*1,700	1.2	1.3	1.2
12	3.1	4.5	2,230	1,040	1,260	2,120	2,240	1,610	1,560	1.2	1.2	1.2
13	3.3	4.5	2,280	911	1,380	2,420	2,280	1,560	1,440	1.2	1.2	1.2
14	3.3	5.2	2,460	764	1,410	2,520	2,330	1,240	*832	1.2	1.2	1.2
15	3.3	6.0	2,520	719	1,440	2,410	2,330	1,110	346	1.2	1.2	1.2
16	3.4	6.7	2,510	713	1,440	2,370	2,330	1,070	73.0	1.2	1.1	1.2
17	3.4	6.9	2,530	713	1,430	2,360	2,420	1,060	24.0	1.2	1.1	1.2
18	3.5	7.0	2,680	707	1,360	2,350	2,480	1,220	10.0	1.2	1.0	1.2
19	3.6	7.2	2,680	707	1,290	2,280	*2,480	1,340	3.0	1.2	1.0	1.2
20	3.6	7.2	2,690	701	1,290	2,270	*2,340	1,030	2.5	1.3	1.1	1.2
21	3.6	7.4	2,570	843	1,290	2,290	2,220	545	2.0	1.3	1.1	1.2
22	3.7	7.6	2,440	1,040	1,290	2,290	2,170	493	1.9	1.3	1.1	1.2
23	3.3	7.8	2,450	1,160	1,290	2,330	2,170	1,040	1.8	1.3	1.1	1.2
24	3.3	8.0	2,360	1,300	1,270	2,590	2,300	889	1.7	1.3	1.1	1.2
25	3.3	8.0	2,250	1,380	1,290	2,720	2,480	*687	1.6	1.3	1.1	1.2
26	3.3	8.0	2,250	1,380	1,460	2,750	2,440	*651	1.6	1.3	1.1	1.1
27	3.3	8.0	2,250	1,320	1,650	2,790	2,320	495	1.5	1.3	1.1	1.1
28	3.4	8.0	2,240	1,350	1,690	2,780	2,300	867	1.4	1.3	1.1	1.0
29	3.4	—	2,240	1,570	1,750	2,620	2,290	1,040	1.3	1.4	1.1	1.0
30	3.4	—	2,240	1,730	1,750	2,220	2,220	1,190	1.2	1.4	1.1	1.0
31	3.4	—	2,220	1,750	2,220	2,170	1,270	1,270	1.4	1.4	1.1	1.0
Sum		163.1	36,458	42,080	65,120	43,937			38.9		35.8	
102.0		63,610.0		67,040			27,976.5			35.8		

Current Year 1959

Period 1938-1959

Month	Extreme Gage Feet		9 Extreme Second-Feet		Average	Total	Acre-Feet				
	High	Low	Day	High	Low	Second-Feet	Acre-Feet	Average	Maximum	Minimum	
Jan.			22	3.7	† 1	3.1	3.3	202	746	4,850	19.2
Feb.			†24	8.0	1	3.6	5.8	324	11,251	64,300	13.0
Mar.	20	2,690	1	8.0	2,050	126,000	74,736	126,000	24,900		
Apr.	1	1,940	20	701	1,220	72,300	96,968	212,000	29,300		
May	†29	1,750	† 5	1,090	1,360	83,500	88,907	412,000	75.2		
June	27	2,790	† 7	1,500	2,170	129,000	112,959	354,000	37,000		
July	†18	2,480	5	1,610	2,160	133,000	118,764	234,000	28,200		
Aug.	6	2,360	27	495	1,420	87,100	113,227	179,000	20,500		
Sept.	5	2,680	30	1.2	933	55,500	57,451	181,000	7,730		
Oct.	†29	1.4	† 1	1	1.3	77.2	7,554	35,400	15.5		
Nov.	† 1	1.4	†18	1.0	1.2	71.0	4,029	14,400	7.0		
Dec.		† 8	1.2	†28	1.0	1.1	70.4	4,180	19,100	6.0	
Yearly				2,790	1.0	949	687,144.6	690,772	1,795,670	219,127	

* Partly estimated † And other days # Mean daily

RIO GRANDE AT EL PASO, TEXAS

DESCRIPTION: Water-stage recorder located on the downstream side of the Courchesne Bridge, 5.6 miles upstream from the Santa Fe Street-Juárez Avenue Bridge between El Paso, Texas and Cd. Juárez, Chihuahua and 1.7 miles above the American Dam, and a staff gage in the pass opposite Courchesne Quarry, .8 mile downstream from the Courchesne Bridge. The cable at the site of the lower gage was dismantled February 18, 1959 and measurements after that were made from the bridge. The zeros of the gages at the recorder and at the lower gage are 3,722.30 and 3,720.51 feet, respectively, 'above mean sea level, U. S. C. & G. S. datum.

RECORDS: Mean daily discharges in 1959 were computed by taking the sum of the flows in the American Canal and the flows at the river station below American Dam. Extreme discharges are those passing the El Paso Station. Records available: 1889 through December 1959.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 24,000 second-feet on June 12, 1905, with a gage height of 6.0 feet at the lower gage. Min. occasionally no flow. Since Elephant Butte Dam was closed in 1915, the largest peak flow to pass this station was 13,500 second-feet on September 3, 1925.

Average Flow in Second-Feet

Daily:	Max.	23,680	June 12, 1905	Min.	0	Occasionally
Monthly:	Max.	14,300	June 1905	Min.	0	Occasionally
Yearly:	Max.	2,780	1905	Min.	70.1	1902

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	76.5	60.5	56.1	756	857	908	1,200	980	750	173	102	101
2	78.0	60.7	56.6	793	1,090	893	1,080	968	704	173	101	97.1
3	78.7	61.4	54.9	650	1,030	1,110	1,160	976	833	178	98.5	101
4	77.2	61.2	96.2	675	900	943	1,000	925	897	167	95.5	105
5	73.6	58.7	616	815	859	983	1,160	939	1,110	160	99.0	101
6	74.3	57.3	610	808	795	988	965	1,030	1,380	157	97.1	96.2
7	74.3	55.0	652	775	680	986	852	1,040	1,280	156	103	98.8
8	72.3	58.5	595	805	614	982	801	1,140	1,070	149	107	102
9	70.2	62.1	670	741	636	954	840	1,210	980	148	103	103
10	69.6	59.6	1,040	662	625	876	942	1,250	858	149	105	108
11	71.6	62.1	913	683	669	865	1,060	1,220	716	146	105	107
12	61.0	60.6	817	736	621	843	1,050	1,060	558	139	106	103
13	58.3	62.2	1,100	678	599	898	977	906	555	142	109	105
14	60.0	62.1	1,240	669	575	1,050	979	1,210	529	138	104	107
15	62.8	60.2	1,290	694	638	1,250	995	1,370	501	139	103	108
16	61.0	62.1	1,250	629	682	1,230	944	1,200	598	137	105	110
17	61.3	62.1	1,260	500	762	1,030	1,070	1,430	535	132	99.9	107
18	60.5	59.6	1,240	509	816	962	988	947	383	132	101	105
19	59.8	59.1	1,340	493	747	920	1,090	931	312	131	106	104
20	65.0	57.8	1,360	463	762	910	1,120	956	285	131	107	108
21	64.0	60.8	1,350	451	662	954	1,140	1,240	278	125	105	109
22	59.0	63.2	1,160	403	616	972	1,020	1,240	270	127	108	112
23	55.0	60.1	917	382	609	992	877	935	238	126	104	118
24	55.1	60.7	889	413	602	958	896	1,820	226	120	101	116
25	56.1	60.7	795	533	647	920	933	1,580	213	121	101	120
26	57.1	60.1	599	657	603	1,100	1,050	814	207	117	104	119
27	58.1	59.5	593	767	632	1,240	1,150	779	196	110	99.7	107
28	58.1	57.2	816	786	660	1,270	1,110	1,130	191	108	101	106
29	65.1	686	783	803	1,340	1,340	1,010	642	186	111	102	105
30	66.2	785	781	839	1,380	912	768	176	125	103	104	119
31	62.8	720	929	983	983	983	838	104				
Sum			1,685.2	19,490	30,707	33,474	4,271	3,312.1				
2,022.6			25,566.8	22,559	31,354	17,015	3,085.7					

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Period 1924-1959					
	High		Low	High				Acre-Feet	Average	Maximum	Minimum		
	High	Low		Day	Day								
Jan.	1	82.3	13	47.8	65.2	4,010	8,999	17,500	220				
Feb.	11	67.8	28	54.9	60.2	3,340	14,551	52,200	136				
Mar.	6.02	28	2,010	4	36.9	825	50,700	34,905	62,500	1,790			
Apr.	5.45	4.26	5	879	24	341	650	55,740	139,000	6,820			
May	6.15	4.76	2	1,180	14	544	728	44,700	62,023	357,000	542		
June	7.00	5.23	3	2,870	12	814	1,020	60,900	65,275	304,000	6,020		
July	6.58	5.33	3	1,650	8	762	1,010	62,200	72,381	198,000	9,920		
Aug.	7.46	24	4,410	29	380	1,080	66,400	74,608	158,000	4,870			
Sept.	6.38	6	1,410	30	170	567	33,700	54,342	171,000	2,430			
Oct.	3.00	2.80	2	183	31	103	138	8,470	21,265	57,900	151		
Nov.	2.88	2.73	16	121	30	89.1	103	6,120	13,745	29,500	229		
Dec.	2.85	2.75	25	126	2	94.6	107	6,570	12,902	27,700	206		
Yearly	7.46			4,410		36.9	533	385,810	490,736	1,559,200	57,481		

† And other days

RIO GRANDE BELOW AMERICAN DAM

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located 3,200 feet below the American Dam and 1.5 miles above the International Dam, west of El Paso, Texas. The American Dam is 1,248.2 river miles above the Gulf of Mexico. The zero of the gage is 3,712.30 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 61 meter measurements and frequent estimates by hydrographer at extreme low flows during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: June 1938 through December 1959.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The operation of the American Dam began June 2, 1938. At this dam, part of the flow passing the El Paso gaging station is diverted into the American Canal (see records of "Diversions from the Rio Grande") and the remainder, including excess flood flows, passes this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 11,300 second-feet on September 14, 1958 with a gage height of 14.50 feet. Min. no flow occurred on March 23, 1955 and for several days in 1956 and 1959.

Average Flow in Second-Feet

Daily:	Max. 6,040	May 20, 1942	Min. 0	Several days 1956 & 1959
Monthly:	Max. 4,880	May 1942	Min. .2	Nov. 1958, Dec. 1959
Yearly:	Max. 1,510	1942	Min. 13.8	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.5	1.8	.3	179	180	186	192	205	219	2.0	1.5	0
2	.4	1.5	.3	193	188	192	191	198	214	2.2	1.5	0
3	.4	1.0	.3	187	180	318	275	194	197	1.5	1.4	0
4	.3	.8	7.6	178	176	202	211	196	219	1.1	2.5	0
5	.3	.6	17.6	181	181	193	208	198	225	3.0	2.8	0
6	.2	.4	13.5	187	176	184	202	199	222	3.0	2.5	0
7	.2	.4	11.5	187	172	186	205	210	225	1.5	2.0	0
8	.2	.4	9.4	186	171	188	203	207	217	1.3	1.8	0
9	.2	.4	10.7	176	173	187	204	206	246	2.2	1.8	0
10	.2	.4	109	172	175	191	194	204	243	3.1	4.2	0
11	.2	.4	18.2	177	177	191	194	208	27.8	2.7	2.7	0
12	32.6	.8	10.6	179	171	192	197	213	5.1	2.2	2.2	0
13	57.3	.5	15.0	175	171	192	200	209	3.8	3.5	1.6	0
14	59.0	.4	16.8	177	176	193	202	355	3.1	1.4	1.6	0
15	61.8	.4	169	184	177	196	198	535	2.1	1.0	1.1	0
16	60.0	.4	268	175	176	191	203	232	2.3	2.6	3.9	0
17	60.3	.4	13.9	178	176	199	212	569	1.6	1.3	2.8	0
18	59.5	.4	12.0	179	174	202	208	180	1.8	1.3	1.9	0
19	58.8	.4	122	178	178	202	201	180	2.3	1.2	.8	0
20	64.0	1.5	367	180	179	199	202	189	1.9	1.0	0	0
21	63.0	.4	362	186	178	199	203	244	1.7	2.3	0	0
22	58.0	.3	254	184	183	202	205	511	4.3	3.4	0	0
23	54.0	.3	7.1	184	183	202	205	213	4.5	1.5	0	5.0
24	54.1	.3	5.0	183	184	198	204	1,300	2.5	1.2	0	.2
25	55.1	.3	3.7	183	177	191	209	1,000	2.3	.8	0	.2
26	56.1	.3	133	180	174	191	203	216	1.7	2.9	0	* .2
27	57.1	.3	6.9	186	171	174	208	213	1.2	1.5	0	* .2
28	57.1	.3	108	196	177	177	210	220	2.0	1.1	0	.2
29	64.1		5.4	193	178	175	207	215	1.2	1.2	0	.2
30	26.2		5.1	193	179	183	201	217	2.4	3.7	0	.2
31	1.8		170		178		201	217		1.9	0	.2
Sum		15.8		5,476		5,876		9,453		60.6	"	6.6
	1,063.0		2,252.9		5,489		6,358		2,302.6		40.6	

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High		Low	Day	High	Low		Average	Maximum	Minimum	
	High	Low									
Jan.	5.21	4.00	20		77.0	.2	34.3	2,110	6,123	12,000	
Feb.	4.37	4.10	20		3.6	.3	.6	31.3	3,587	32,800	
Mar.	7.24	4.11	28		848	.1	.3	72.7	4,470	2,619	
Apr.	6.11	5.57	29		253	2	114	183	10,900	9,890	
May	5.91	5.74	1		205	27	164	177	29,785	300,000	
June	8.03	5.75	3		1,370	30	161	196	20,716	250,000	
July	6.84	5.83	3		558	2	176	205	12,600	35.5	
Aug.	10.50	5.15	24		3,980	23	62.0	305	18,800	17,685	
Sept.	5.87	4.07	9		280	28	1.0	76.8	4,570	155,000	
Oct.	4.28	4.06	16		7.9	.26	.7	2.0	120	14,913	
Nov.	4.34				11.3	.19	0	1.4	80.5	12,163	
Dec.					23	g <u>u</u>	5.0	u	13.1	11,968	
Yearly	10.50				3,980		0	105	76,294.9	121,596	
									1,093,553	10,001.1	

^u Estimated * Partly estimated † And other days g Mean daily

RIO GRANDE AT ISLAND STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located near Clint, Texas, and San Agustín, Chihuahua. This station is on the rectified channel of the Rio Grande, 27.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 3,608.99 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 55 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: August 17, 1938 through December 1959.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 7,050 second-feet on September 14, 1958 with a gage height of 15.80 feet. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max. 6,140	May 19, 1942	Min. 0	Frequently
Monthly:	Max. 4,880	May 1942	Min. 0	Frequently
Yearly:	Max. 1,490	1942	Min. * .3	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	61.9	59.0	8.7	7.9	7.3	13.9	111	14.7	18.4	5.1	2.7	85.7
2	57.4	47.7	7.6	8.0	7.6	14.3	9.9	14.1	12.2	5.0	36.9	84.5
3	60.8	25.0	6.6	8.9	7.8	82.5	112	13.6	12.2	4.3	36.8	80.7
4	55.2	10.3	6.4	9.0	7.6	85.0	15.9	13.0	25.1	4.1	26.1	83.7
5	52.6	7.8	84.7	7.8	7.1	11.0	11.3	12.5	10.3	3.9	* 20.8	86.8
6	56.1	7.4	14.8	9.5	7.0	13.3	12.3	12.2	21.2	3.8	18.5	86.4
7	55.5	7.6	8.5	9.7	7.0	12.6	12.0	11.8	89.7	3.6	26.3	84.9
8	54.3	9.0	* 7.6	9.5	7.5	13.2	11.7	11.5	16.0	3.4	29.7	78.7
9	53.2	10.4	* 7.6	9.9	7.9	12.5	11.5	11.1	13.9	3.8	30.8	79.5
10	53.0	7.7	104	9.0	8.4	13.0	12.5	105	13.2	4.0	25.9	82.0
11	52.9	8.5	18.1	8.9	7.9	12.3	12.3	25.9	10.8	4.1	26.0	38.5
12	49.2	8.2	9.6	8.4	7.9	11.6	12.7	15.2	9.7	4.5	22.8	* 7.9
13	49.1	8.5	7.5	8.8	7.9	10.9	12.5	13.4	10.0	4.5	41.9	* 5.2
14	33.4	8.7	12.7	8.8	8.5	10.7	13.0	13.7	12.3	7.5	81.0	* 4.1
15	32.3	9.0	122	8.9	9.0	40.4	12.4	367	11.5	6.3	98.6	* 3.2
16	37.1	9.2	128	9.0	8.8	45.5	12.0	23.5	11.2	4.0	86.3	2.2
17	40.0	9.5	70.1	8.5	8.0	16.8	11.2	313	10.7	4.0	60.2	1.5
18	40.8	8.0	* 12.5	7.7	9.0	11.7	10.9	92.5	10.2	15.0	64.5	.7
19	39.8	8.3	11.1	7.3	9.5	10.6	11.0	17.6	9.1	5.0	76.5	.9
20	49.6	8.1	142	7.0	9.6	9.5	11.1	27.7	18.0	4.0	86.9	1.6
21	45.0	8.4	129	6.8	9.6	10.1	12.1	117	22.5	2.3	90.4	1.3
22	50.4	8.8	181	7.2	9.2	9.6	12.2	563	18.1	2.4	91.8	2.0
23	47.9	8.2	* 31.8	7.3	9.2	9.7	11.6	79.0	13.3	2.5	93.3	2.2
24	50.3	8.5	15.2	7.3	9.3	10.4	11.1	444	12.8	2.6	82.0	1.8
25	50.2	7.9	* 14.6	7.0	9.7	11.0	10.6	1,100	9.2	2.7	71.7	16.1
26	47.6	8.2	13.4	7.0	9.7	11.6	10.9	86.1	7.3	2.8	82.8	42.1
27	54.6	10.0	12.2	6.9	9.7	11.6	10.8	21.8	6.6	2.9	85.8	52.4
28	56.0	8.8	128	6.9	9.3	12.8	11.1	125	6.3	3.0	88.6	59.2
29	56.0		31.9	6.8	9.0	62.6	12.4	83.6	6.1	3.0	91.8	64.1
30	57.9		13.0	6.9	8.6	145	12.8	24.8	6.1	3.0	91.2	61.6
31	57.9		10.5		9.4		27.7	22.4		3.0		68.9
Sum	346.7		242.6	264.0	745.7		3,795.7		* 130.1		1,270.4	
	1,558.0		1,370.7		582.5				454.0		1,768.6	

Current Year 1959

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet			Period Sept. 1938-1959
	High		Low	Day	Day			Average	Maximum	Minimum	
	High	Low	Day	Day	Day	Acre-Feet					
Jan.	9.00	8.53	31	85.9	14	15.4	50.3	3,090	5,985	11,900	0
Feb.	8.97	8.33	1	72.4	6	6.8	12.4	668	4,484	37,000	0
Mar.	10.69	8.31	28	900	14	4.3	44.2	2,720	3,153	21,000	0
Apr.	8.42	8.23	9	9.9	† 27	6.0	8.1	481	5,504	70,500	0
May	8.42	8.29	15	10.2	1	6.8	8.5	524	16,207	299,800	0
June	11.37	8.42	25	1,030	20	9.0	24.9	1,480	13,750	241,000	0
July	10.05	8.42	1	312	2	6.7	18.8	1,160	10,972	* 118,500	0
Aug.	13.20	8.49	25	2,260	10	10.8	122	7,530	10,591	99,400	0
Sept.	9.60	8.36	7	185	30	5.3	15.1	901	12,611	* 119,200	0
Oct.	9.02		18	56.9	21	g <u>2</u>	2.3	* 4.2	258	5,619	42,800
Nov.	9.21		15	105	1	g <u>2</u>	2.7	59.0	3,510	1,405	7,270
Dec.	9.11	8.02	1	89.2	18	.7	41.0	2,520	2,549	12,900	0
Yearly	13.20			2,260		.7	34.3	24,862	92,830	1,079,340	238.1

^u Estimated * Partly estimated † And other days ^g Mean daily

RIO GRANDE AT COUNTY LINE STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located .8 mile downstream from the El Paso-Hudspeth County line. This station is on the rectified channel of the Rio Grande 47.3 river miles below the American Dam at El Paso, Texas. The zero of the gage is 3,547.59 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 7 meter measurements, frequent inspections of the station during the year, and a continuous record of gage heights. Records available: January 1938 through December 1959.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 6,340 second-feet on May 19, 1942, with a gage height of 8.66 feet. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max. 6,180	May 18, 1942	Min. 0	Frequently
Monthly:	Max. 4,920	May 1942	Min. 0	Frequently
Yearly:	Max. 1,720	1942	Min. 0	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	* 3.8	0	0	0
2	0	0	0	0	0	0	0	0	1.1	2.8	0	0
3	0	0	0	0	0	0	0	0	0	4.8	0	0
4	0	0	0	0	0	0	0	0	0	5.0	0	0
5	0	0	0	0	0	0	0	0	0	6.0	0	0
6	0	0	0	0	0	0	0	0	0	4.7	0	0
7	0	0	0	0	0	0	0	0	0	3.8	0	0
8	0	0	0	0	0	0	0	0	0	3.6	0	0
9	0	0	0	0	0	0	0	0	0	3.1	0	0
10	0	0	0	0	0	0	0	0	0	2.7	0	0
11	0	0	0	0	0	0	0	0	0	2.1	0	0
12	0	0	0	0	0	0	0	0	0	1.7	0	0
13	0	0	0	0	0	0	0	0	0	1.3	0	0
14	0	0	0	0	0	0	0	0	0	1.8	0	0
15	0	0	0	0	0	0	0	0	0	1.8	0	0
16	0	0	0	0	0	0	0	0	0	1.8	0	0
17	0	0	0	0	0	0	0	0	0	1.5	0	0
18	0	0	0	0	0	0	0	0	0	1.9	0	0
19	0	0	0	0	0	0	0	0	0	2.5	0	0
20	0	0	0	0	0	0	0	0	0	2.5	0	10.4
21	0	0	0	0	0	0	0	0	0	2.5	u .6	18.7
22	0	0	u 20.0	0	0	0	0	0	0	2.8	0	0
23	0	0	u 15.0	0	0	0	0	0	0	2.5	0	22.9
24	0	0	0	0	0	0	0	0	0	5.8	0	76.0
25	0	0	0	0	0	0	0	0	0	11.1	7.3	74.0
26	0	0	0	0	0	0	0	0	391	2.4	8.6	9.6
27	0	0	0	0	0	0	0	0	27.2	3.0	1.4	10.2
28	0	0	0	0	0	0	0	0	12.0	0	0	11.9
29	0	0	u 30.0	0	0	0	0	0	150	0	0	7.7
30	0	0	u 15.0	0	0	0	0	0	36.9	0	0	0
31	0	0	0	0	0	0	0	0	8.8	0	0	0
Sum	0	0	u 80.0	0	0	0	0	0	1,693.3	29.0	90.1	262.3

Current Year 1959

Period 1938-1959

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.				0	0	0	0	8,999	20,000	0
Feb.				0	0	0	0	7,773	47,900	0
Mar.	2.10		29	u 118	† 1	0	u 2.6	6,822	38,900	0
Apr.				0	0	0	0	10,310	84,200	0
May				0	0	0	0	19,874	303,000	0
June				0	0	0	0	17,556	239,000	0
July				0	0	0	0	16,154	140,000	0
Aug.	5.35		26	1,220	† 1	0	54.6	3,360	15,652	123,000
Sept.	2.70		18	39.3	† 2	0	1.0	57.5	18,580	140,000
Oct.	2.50		26	15.9	† 1	0	2.9	179	11,874	61,400
Nov.	2.45		28	13.4	† 1	0	1.6	93.8	7,927	20,400
Dec.	2.88		†23	80.5	† 1	0	8.5	520	8,750	29,700
Yearly	5.35			1,220		0	6.0	4,369.3	150,271	1,247,500

u Estimated * Partly estimated † And other days

RIO GRANDE AT FORT QUITMAN, TEXAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located on the rectified channel of the Rio Grande, 1.5 miles below Old Fort Quitman and 81.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 3,450.57 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on frequent estimates during low flow, 18 meter measurements during the year, and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1889 through December 1959.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS‡ : Momentary: Max. 10,600 second-feet on October 5, 1946, with a gage height of 10.00 feet. Min. frequently no flow.

Average Flow in Second-Feet‡

Daily:	Max. 5,890	May 19, 1942	Min. 0	Frequently
Monthly:	Max. 5,030	May 1942	Min. 0	Several months 1952 & 1955-1959
Yearly:	Max. 1,750	1942	Min. 6.7	1957

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.8	.4	.2	0	0	0	14.7	0	15.0	2.4	34.9	22.8
2	.8	.3	.2	0	0	0	.8	0	* 7.5	0	30.5	14.5
3	.8	.2	.1	0	0	0	0	0	* 4.0	81.8	28.0	7.4
4	.8	.2	0	0	0	0	0	0	* 2.0	200	25.0	9.1
5	.7	.2	0	0	0	0	0	66.5	0	* 1	21.4	10.4
6	.6	.2	0	0	0	0	0	28.8	0	1.7	20.7	10.5
7	.6	.2	0	0	0	0	0	0	0	0	20.7	10.2
8	.6	.2	0	0	0	0	91.2	0	0	3.5	16.7	9.7
9	.6	.2	0	0	0	0	3.1	0	0	3.2	11.9	11.0
10	.6	.2	0	0	0	0	.4	0	0	3.2	8.8	10.8
11	.6	.2	0	0	0	0	0	5.2	0	3.5	8.8	12.9
12	.6	.2	0	0	0	0	0	0	0	3.5	* 9.3	14.5
13	.5	.2	0	0	0	0	* 280	7.3	2.5	2.6	13.6	10.3
14	.5	.2	0	0	0	0	* 6.0	12.1	5.6	17.1	18.0	15.6
15	.5	.2	0	0	18.9	0	0	10.2	.8	3.5	39.4	41.4
16	.5	.2	0	0	u .1	0	0	6.6	0	1.4	37.5	34.8
17	.5	.2	0	0	0	0	118	2.5	7.2	.2	22.1	35.2
18	.4	.2	0	0	0	0	9.0	0	6.6	0	16.0	25.1
19	.4	.2	0	0	0	0	0	0	15.5	0	28.3	21.4
20	.4	.2	0	0	0	0	0	152	10.8	2.3	42.3	26.7
21	.4	.2	0	0	0	0	0	0	64.6	8.0	34.3	30.6
22	.4	.2	0	0	0	0	0	300	6.9	3.0	25.5	47.2
23	.4	.2	0	0	631	0	0	250	5.1	3.2	31.9	53.8
24	.4	.2	0	0	* 184	0	0	260	2.1	2.1	33.0	54.6
25	.4	.2	0	0	0	.4	0	401	8.1	.7	16.9	68.1
26	.4	.2	0	0	0	0	.9	0	649	5.0	2.0	10.8
27	.4	.2	0	0	0	0	0	0	349	3.3	3.1	8.0
28	.4	.2	0	0	0	0	0	0	309	2.5	3.5	7.3
29	.4	0	0	0	0	73.3	0	u 109	2.4	u 69.7	9.1	14.8
30	.4	0	0	0	0	3.8	67.0	u 72.0	2.4	* 53.9	9.2	5.8
31	.4	0	0	0	0	39.2	u 30.0	0	u 37.0	0	2.5	
Sum	5.9	0	0	78.4	3,084.8	*	511.5	744.3				
	16.2	.5	834.0	*	629.4		123.3	*	639.9			

Current Year 1959

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High		Low	Day				Average	Maximum	Minimum		
	High	Low		Day	High							
Jan.	4.51	4.35	† 1	0	.8	† 18	0	.5	32.1	20,900		
Feb.			1	0	.4	† 3	0	.2	11.7	10,055		
Mar.			† 1	0	.2	† 4	0	0	1.0	8,331		
Apr.					0		0	0	10,360	* 77,000		
May	9.61	23	3,560	† 1	0	0	26.9	1,650	18,887	309,000		
June	6.12	29	595	† 1	0	0	2.6	156	17,107	240,000		
July	6.81	13	999	† 3	0	0	* 20.3	* 1,250	17,932	140,000		
Aug.	7.30	20	900	† 1	0	0	99.5	6,120	22,315	* 235		
Sept.	5.60	25	36.3	† 5	0	0	4.1	245	25,283	147,000		
Oct.	7.90	3	1,350	† 2	0	0	* 16.5	* 1,010	18,747	66,500		
Nov.	6.03	5.22	15	94.0	27	5.7	* 21.3	* 1,270	11,826	24,500		
Dec.	5.92	5.11	25	72.7	31	1.4	24.0	1,480	12,219	31,000		
Yearly	9.61			3,560		0	* 18.3	* 13,225.8	183,206	1,270,400	4,843	

* Estimated * Partly estimated † And other days Ø Mean daily ‡ Period 1924-1959

RIO GRANDE AT UPPER PRESIDIO STATION

DESCRIPTION: Water-stage recorder and cable with sit-down cable car equipped for winch and heavy weights, located 7.8 river miles above the confluence of the Rio Conchos, about 10 miles northwest of Presidio, Texas and Ojinaga, Chihuahua, and 285.7 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,576.66 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 18 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1889 through December 1959.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. During 1959, a small earth and brush dam one-half mile downstream caused backwater frequently which affected the gage heights at the station.

EXTREME FLOWS FROM RECORDS: Momentary: Max., 14,000 second-feet on June 14, 1905. Highest flow recorded since 1924 was 5,160 second-feet, with a gage height of 10.57, on May 26, 1942. Min. frequently no flow.

Average Flow in Second-Feet ‡

Daily:	Max. 13,700	June 13 & 14, 1905	Min. 0	Frequently
Monthly:	Max. 10,150	June 1905	Min. 0	Frequently
Yearly:	Max. 1,970	1907	Min. 3,5	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	35.7	2.5	168	3.4	0	0
2	0	0	0	0	0	0	212	.3	29.5	14.4	0	0
3	0	0	0	0	0	28.6	183	0	* 2.7	u .3	0	0
4	0	0	0	0	0	9.1	151	0	* .7	u .3	0	0
5	0	0	0	0	0	133	32.5	0	u .5	u 0	0	0
6	0	0	0	0	0	179	143	0	u .3	0	0	0
7	0	0	0	0	0	195	34.0	0	u .1	68.3	0	0
8	0	0	0	0	0	42.9	.2	0	0	149	0	0
9	0	0	0	0	0	0	2.7	.4	0	0	115	0
10	0	0	0	0	0	0	.9	0	0	9.9	0	0
11	0	0	0	0	0	0	2.1	0	0	u 1.2	0	0
12	0	0	0	0	0	0	3.0	0	0	u 2.0	0	0
13	0	0	0	0	0	0	0	0	0	u 2.0	0	0
14	0	0	0	0	0	0	0	0	0	u 1.0	0	0
15	0	0	0	0	0	0	0	0	0	u .5	0	0
16	0	0	0	0	0	0	0	0	0	.1	0	0
17	0	0	0	0	0	0	0	0	0	.1	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	u 2.7	0	0	0
21	0	0	0	0	0	0	0	0	10.1	u 1.5	0	0
22	0	0	0	0	0	0	0	0	0	u .5	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	37.4	0	0	57.1	0	0	0
25	0	0	0	0	0	8.6	0	0	175	0	0	0
26	0	0	0	0	0	0	0	0	166	0	0	0
27	0	0	0	0	0	0	0	0	211	0	0	0
28	0	0	0	0	0	0	0	0	214	0	0	0
29	0	0	0	0	0	0	18.1	0	253	0	0	0
30	0	0	0	0	0	0	4.5	0	260	0	0	0
31	0	0	0	0	0	0	0	0	260	0	0	0
Sum					0	0	46.0	612.9	797.8	1,609.0	206.5	367.5
					0	0	46.0	612.9	797.8	1,609.0	206.5	367.5

Current Year 1959

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total	Acre-Feet		
							Average	Maximum	Minimum
	High	Low	Day	Day					
Jan.			0	0	0	0	9,456	24,400	0
Feb.			0	0	0	0	8,763	40,800	0
Mar.			0	0	0	0	6,940	39,100	0
Apr.			0	0	0	0	5,715	41,600	0
May	7.38	24	89.9	† 1	0	1.5	91.2	13,719	240,000
June	8.98	7	214	† 1	0	20.4	1,220	13,544	216,000
July	9.95	6	280	† 13	0	25.7	1,580	18,711	158,000
Aug.	9.74	29	272	† 3	0	51.9	3,190	24,438	133,000
Sept.	9.36	1	244	† 8	0	6.9	410	27,595	* 131,000
Oct.	8.16	9	162	† 1	0	11.9	729	23,784	105,000
Nov.			0	0	0	0	11,028	34,500	0
Dec.			0	0	0	0	10,697	30,900	0
Yearly	9.95		280		0	10.0	7,220.2	174,390	1,176,700
									2,514.4

^u Estimated * Partly estimated † And other days ^t Period June 1900, March 1914, September 1919, March 1920, and 1924-1959.

RIO CONCHOS NEAR OJINAGA, CHIHUAHUA

DESCRIPTION: Water-stage recorder and cable with stand-up cable car and winch, located 1.9 miles west of Ojinaga, Chihuahua, 3.7 miles west of Presidio, Texas, and 1.5 miles upstream from the confluence with the Rio Grande. The Río Conchos enters the Rio Grande 13.8 miles above the Lower Presidio gaging station on the Rio Grande and 293.5 river miles below the American Dam at El Paso, Texas. The zero of the gage, as corrected by recent check-levels, is 2,568.04 feet above mean sea level, U. S. C. & G. S. datum. The figure previously reported was in error. Records of stage and measured discharge at this station began April 4, 1954.

RECORDS: Based on 272 meter measurements during the year, 261 by the Mexican and 11 by the United States Section of this Commission, a continuous record of gage heights and a rating curve which, above 15,000 second-feet, was defined previously by related gage height and records of discharge at Lower Presidio Station. Computations by shifting channel methods. Records available: January 1896 through December 1959.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. La Boquilla Reservoir with 2,417,500 acre-feet capacity, La Colina Reservoir with 19,500 acre-feet capacity and La Rosettilla Reservoir with 15,400 acre-feet capacity are located 250, 242 and 186 river miles respectively above this station. Francisco I. Madero Reservoir, with capacity of 344,600 acre-feet, is located on the Río San Pedro, a tributary which enters the Río Conchos 174 river miles above this station. Power generation facilities: La Boquilla 14,647 kw., La Colina 3,620 kw., La Rosettilla 5,150 kw., Francisco I. Madero none.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 162,000 second-feet on September 11, 1904. Min. no flow several days in May, June and July 1953 and in July 1955.

Average Flow in Second-Feet ‡

Daily:	Max.	148,900	Sept.	11, 1904	Min.	0	Several days	1953 & 1955
Monthly:	Max.	24,540	Sept.	1904	Min.	4.7	Apr.	1955
Yearly:	Max.	3,710		1906	Min.	155		1953

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	943	333	344	304	396	282	1,660	540	20,270	491	413	424
2	1,060	337	431	309	441	275	2,460	438	12,780	448	477	466
3	869	342	357	265	371	293	2,110	406	6,220	445	505	473
4	763	343	360	223	353	331	1,650	406	4,660	456	590	459
5	780	345	311	212	299	340	1,120	360	3,810	441	499	392
6	724	334	304	220	256	349	2,470	381	2,660	491	403	374
7	675	335	314	209	294	360	2,300	335	2,120	494	371	403
8	604	342	327	196	678	378	1,520	307	1,730	466	396	607
9	569	338	340	187	459	367	922	353	1,230	459	413	551
10	533	336	367	177	371	420	780	544	1,040	445	399	445
11	600	352	328	175	310	353	678	438	1,060	452	420	417
12	685	427	305	189	299	309	607	335	971	431	396	403
13	710	491	277	214	424	308	650	307	886	448	533	399
14	604	406	285	371	353	297	558	307	865	427	590	417
15	551	367	315	396	335	299	487	353	830	413	664	537
16	632	345	311	399	1,330	303	498	378	830	424	816	526
17	629	327	299	371	371	347	516	307	742	459	678	448
18	622	350	328	399	353	310	364	586	671	441	561	420
19	632	351	309	434	299	269	463	1,720	632	456	445	413
20	614	322	290	420	299	250	643	2,410	572	480	403	459
21	569	314	270	396	299	225	427	3,000	572	466	392	516
22	484	314	264	403	256	207	360	3,140	512	434	385	749
23	484	298	254	343	256	210	399	3,220	579	438	431	614
24	448	331	271	288	309	305	351	3,740	540	456	399	509
25	434	347	264	280	256	174	324	3,710	540	466	473	452
26	434	322	266	267	267	176	335	2,480	512	448	463	410
27	417	284	235	273	256	164	364	6,220	512	438	498	378
28	399	264	266	284	360	276	431	9,360	512	417	403	424
29	399	367	272	315	268	268	338	4,910	540	403	371	547
30	385	341	272	256	452	325	3,850	540	378	364	544	519
31	367	303	267				501	7,490	413			
Sum	9,597		8,748		8,897		62,331		13,824		14,695	
	18,619		9,603		11,388		26,611		69,938		14,151	

Current Year 1959

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Period 1924-1959		
	High		Day	High	Low			Average	Maximum	Minimum
	High	Low	Day	Day	Low					
Jan.	7.15	5.84	2	1,180	31	367	601	36,940	49,295	147,000
Feb.	6.30	5.61	12	579	28	246	343	19,030	43,094	87,700
Mar.	6.10	5.51	1	505	27	232	310	19,050	37,952	80,800
Apr.	5.97	5.05	14	463	10	166	292	17,350	25,110	79,700
May	10.17	5.28	16	3,960	6	223	367	22,600	30,948	148,000
June	6.82	5.02	30	1,070	27	148	297	17,650	36,063	91,900
July	12.30	5.09	6	5,650	29	170	858	52,780	80,013	502,000
Aug.	15.52	5.41	28	16,170	17	286	2,010	123,600	111,915	601,000
Sept.	16.40	6.00	1	25,570	27	480	2,330	138,700	227,653	1,173,000
Oct.	6.07	5.74	1	512	30	360	446	27,420	157,984	* 971,300
Nov.	6.69	5.71	15	975	30	357	472	28,060	54,296	110,000
Dec.	6.66	5.71	22	865	7	360	474	29,150	46,073	97,700
Yearly	16.40	5.02		25,570		148	735	532,330	900,396	2,431,850
										111,885

^a Estimated * Partly estimated † And other days ^b Period 1900-March 1914; September 1919-March 1920; and 1924-1959.

ALAMITO CREEK NEAR PRESIDIO, TEXAS

DESCRIPTION: Water-stage recorder about 1,800 feet above the confluence with the Rio Grande. Measurements of high flows are made from the highway bridge, 200 feet downstream from the recorder. This creek enters the Rio Grande near the lower end of Presidio Valley, 9.7 river miles below the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua, and 306.9 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,541.61 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 96 meter measurements made during the year, of low and medium flows, a high flow rating curve determined by slope-area calculations, and a continuous record of gage heights. Computations by shifting channel methods. This station is affected by backwater during times of high flows in the Rio Grande. Records available: January 1932 through December 1959.

REMARKS: A small irrigation reservoir (San Esteban) 10.5 miles south of Marfa, Texas and irrigation diversions below the reservoir modify the flow of this spring-fed creek. On September 28, 1958 backwater from the Rio Grande reached a gage height of 9.57 feet at this station. This is the highest recorded gage height.

EXTREME FLOWS FROM RECORDS: Momentary: Max. *16,400 second-feet on September 24, 1955, with a gage height of 7.33 feet. Min. .01 second-foot on July 25, 1953 and several days in August 1958.

Average Flow in Second-Feet

Daily:	Max. 3,290	Oct. 24, 1941	Min. .1	July 25, 1953 & several days in August 1958
Monthly:	Max. 418	Sept. 1958	Min. .6	Oct., Nov., & Dec. 1953
Yearly:	Max. 55.9	1941	Min. .4	1951

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.8	1.3	1.4	1.1	" 2.0	.6	184	1.4	1.0	.9	* 1.3	1.1
2	1.9	1.4	1.4	1.1	.9	97.4	280	1.4	1.1	" 1.3	1.3	1.0
3	1.8	1.4	1.3	1.1	.8	* 983	15.5	1.4	* 87.3	1.5	1.3	1.0
4	1.7	1.4	1.2	1.1	.7	158	* 1.6	1.4	286	" 1.2	1.2	1.1
5	1.6	1.4	1.1	1.1	.7	* 4.5	* 1.5	1.4	" 4.0	1.0	1.2	1.1
6	1.5	1.4	1.2	1.1	.6	89.3	460	366	9.5	.9	1.2	1.1
7	1.4	1.4	1.2	1.1	" 10.0	331.2	61.0	14.2	76.3	.9	1.2	1.2
8	1.4	1.4	1.3	1.0	" 450	* 6.9	1.4	" 7.1	2.5	.9	1.2	1.2
9	1.4	1.4	1.4	1.0	" 2.0	2.2	1.4	" 3.6	* 1.4	.9	1.2	1.2
10	1.4	1.4	1.4	1.0	.8	1.6	1.3	24.4	* 1.4	.9	1.2	1.2
11	1.4	1.5	1.4	1.0	.8	.9	1.2	* 4.8	1.4	.9	1.2	1.3
12	1.4	1.6	1.3	1.0	.8	.9	1.2	* 2.4	1.5	1.0	1.2	1.3
13	1.4	1.6	1.3	1.0	.8	1.0	1.2	* 2.4	1.6	1.0	1.2	1.3
14	1.4	1.5	1.3	1.0	.7	1.0	1.2	* 4.8	1.7	.9	* 7.0	1.4
15	1.4	1.5	1.2	1.1	.7	1.0	* 114	* 2.4	1.5	.9	1.1	1.4
16	1.4	1.4	1.2	1.1	" 5.0	1.0	147	* 1.8	1.3	.9	1.1	1.4
17	1.4	1.4	1.2	1.0	.7	1.0	223	28.4	1.0	.9	1.0	1.3
18	1.5	1.4	1.2	1.0	.7	1.0	33.0	7.3	1.0	.9	1.0	1.2
19	1.5	1.3	1.2	1.0	.7	1.0	* 386	* 754	* 1.0	.9	1.0	1.2
20	1.4	1.3	1.2	.9	.6	1.0	* 425	* 16.9	* 1.0	.9	1.0	1.2
21	1.4	1.3	1.3	.9	.6	1.0	3.5	* 1.6	142	.9	1.0	1.3
22	1.3	1.3	1.3	.8	.6	1.0	1.3	* 24.8	* 4.0	.9	1.0	1.3
23	1.3	1.3	1.4	.8	" 10.0	* 1.2	1.3	* 6.9	* 1.7	.9	1.0	1.3
24	1.3	1.3	1.4	.8	" 40.0	* 2.0	1.3	* 5.3	1.5	.9	1.0	1.3
25	1.3	1.4	1.4	.7	.8	1.0	1.2	* 31.4	1.4	.9	1.0	1.3
26	1.3	1.4	1.3	.7	.8	299	1.2	* 6.2	.9	1.0	1.3	
27	1.3	1.4	1.3	.6	.9	" 35.0	1.1	105	1.2	.9	1.0	1.3
28	1.3	1.4	1.2	.6	" 10.0	1.0	1.1	20.1	1.2	.9	1.1	1.3
29	1.3	1.2	.7	.9	256	60.4	* 27.0	1.1	.9	1.2	1.3	
30	1.3	1.1	.8	.8	73.0	4.5	* 1.2	1.0	92.3	1.2	1.3	
31	1.3	1.1	.7	.7		1.4	* 1.0	14.3				
Sum	39.2	28.2	" 2,363.5	* 1,478.0	639.9	134.3	38.5					
	44.5	39.4	" 537.1	* 2,418.8	639.9	134.3	39.4					

Current Year 1959

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total	Acre-Feet				
	High		Day	High				Average	Maximum	Minimum		
	High	Low		Day	Day							
Jan.	5.22	5.21	2	0	1.9	† 22	0	1.3	1.4	88.3		
Feb.	5.30	5.21	† 12	0	1.6	† 1	0	1.3	1.4	77.8		
Mar.	5.28	5.25	† 1	0	1.4	† 5	0	1.1	1.3	78.1		
Apr.	5.28	5.17	† 1	0	1.1	† 27	0	.6	.9	55.9		
May	7.38	8	0	450	1	6	.6	† 17.3	† 1,070	1,055		
June	7.96	3	9,100	1	0	.6	* 78.8	* 4,690	* 1,923	8,520		
July	6.77	19	* 3,410	† 27	0	1.1	* 78.0	* 4,800	* 3,160	6,360		
Aug.	7.05	19	* 4,500	31	0	1.0	* 47.7	* 2,930	* 2,930	18,500		
Sept.	6.87	3	* 3,900	1	1	0.0	21.3	1,270	* 3,780	24,900		
Oct.	5.25	30	425	† 1	0	.9	4.3	266	1,918	123		
Nov.	4.24	14	0	7.0	† 23	0	1.3	78.1	190	19,200		
Dec.	4.22	† 14	0	1.4	† 2	0	1.2	76.4	175	807		
Yearly	7.96		* 9,100	0	.6	* 21.4	* 15,480.6	* 15,990	40,444	* 3,109.2		

" Estimated * Partly estimated † And other days 0 Mean daily

RIO GRANDE AT LOWER PRESIDIO STATION

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located about 10.1 river miles below the international highway bridge between Presidio, Texas, and Ojinaga, Chihuahua, .4 mile below the confluence of Alamito Creek with the Rio Grande, and 307.3 river miles below American Dam at El Paso, Texas. The zero of the gage is 2,527.99 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 108 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1955 through December 1959 at this location. Records, published under this same station name, are also available from January 1936 through June 13, 1932 for a station located about 12.1 miles (erroneously reported in Water Bulletin Number 1 as 7.5 miles) below the confluence of the Rio Conchos and 1.3 miles above Alamito Creek; and from June 14, 1932 through December 31, 1954 for a station about 2.0 miles below the Rio Conchos confluence and 11.4 miles above the confluence of Alamito Creek.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS †: Momentary: Max. 54,300 second-feet on October 1, 1958, with a gage height of 20.37 feet. Min. .2 second-foot several days in July 1955, and on June 30, 1958.

Average Flow in Second-Feet ‡

Daily:	Max. 52,200	Oct. 1, 1958	Min. .2	Several days July 1955; June 30, 1958
Monthly:	Max. 17,100	Oct. 1958	Min. 3.6	May 1955
Yearly:	Max. 2,590	1958	Min. 283	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	880	394	329	275	361	337	* 1,840	620	10,400	490	477	440
2	1,050	389	442	284	516	342	* 3,040	459	13,000	464	466	507
3	892	388	375	244	389	1,220	* 2,950	397	7,630	461	583	492
4	760	394	380	216	368	607	2,000	385	5,500	478	587	520
5	732	405	360	222	324	362	1,250	354	3,940	489	599	428
6	694	406	341	231	275	515	* 3,120	* 701	2,840	528	481	395
7	662	406	323	226	313	876	2,670	346	2,190	543	417	388
8	602	412	328	213	1,230	557	1,880	299	1,860	591	420	538
9	565	413	320	197	491	387	973	338	1,390	633	449	618
10	554	419	347	193	382	366	774	394	1,140	527	438	492
11	596	425	330	186	346	339	665	543	1,100	497	440	453
12	707	455	337	183	327	345	586	316	1,030	472	442	431
13	739	597	308	192	385	382	584	294	887	476	486	430
14	681	515	306	330	378	344	588	292	825	466	615	424
15	563	479	304	410	329	323	570	321	807	456	645	532
16	633	439	325	430	1,280	294	631	387	812	439	799	588
17	634	412	321	406	405	304	653	332	803	490	696	496
18	608	412	334	411	365	304	436	366	742	498	656	450
19	607	423	349	466	330	255	534	2,080	680	520	537	428
20	606	383	322	452	309	230	1,060	* 2,030	630	526	475	497
21	557	385	322	434	331	225	488	* 3,070	677	510	446	516
22	481	374	313	440	296	213	382	* 3,630	627	479	438	733
23	452	364	301	387	280	194	376	* 3,070	587	457	463	725
24	452	389	309	335	652	262	398	* 4,610	565	488	455	585
25	454	403	287	304	300	194	333	* 4,630	564	504	513	546
26	462	394	289	310	278	468	326	2,600	554	506	477	489
27	439	347	271	290	278	188	307	5,580	537	494	568	444
28	425	333	277	290	383	234	399	8,240	528	484	486	452
29	422	340	309	300	499	538	363	6,690	513	475	432	549
30	425	337	304	299	451	326	4,610	513	512	425	672	
31	414	318			312		345	6,230	473			560
Sum			11,555	9,161	11,656		* 64,214		15,426			15,818
			18,748	10,145	13,011		* 30,847		63,871			15,411
Current Year 1959										Period 1955-1959		
Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total	Acre-Feet					
	High	Low	Day	Day			Acre-Feet	Average	Maximum	Minimum		
Jan.	6.60	5.74	2	1,160	31	408	605	37,200	22,080	37,200	14,900	
Feb.	5.95	5.52	13	625	28	323	413	22,900	19,280	26,700	13,300	
Mar.	5.75	5.31	2	456	27	259	327	20,100	12,842	20,100	7,710	
Apr.	5.68	5.03	19	492	10	168	305	18,200	6,226	18,200	309	
May	7.75	5.21	16	3,260	28	240	420	25,800	13,496	31,800	219	
June	8.32	5.01	3	4,400	27	143	389	23,100	* 13,534	23,100	2,600	
July	8.98	5.32	6	6,220	31	285	* 995	* 61,200	* 33,680	* 79,900	4,680	
Aug.	10.33	5.28	28	9,630	13	276	* 2,070	* 127,000	* 78,180	* 163,000	20,600	
Sept.	11.79	5.61	2	14,600	30	505	2,130	127,000	171,680	582,000	23,500	
Oct.	5.73	5.44	30	662	16	426	498	30,600	265,580	1,051,000	24,000	
Nov.	5.96	5.42	16	864	7	401	514	30,600	43,980	111,100	23,000	
Dec.	6.01	5.42	22	912	7	375	510	31,400	29,800	51,700	21,600	
Yearly	11.79	5.01		14,600		143	767	555,100	710,358	1,876,260	205,790	

* Partly estimated † Period 1955-1959

TERLINGUA CREEK NEAR TERLINGUA, TEXAS

DESCRIPTION: Bubbler-type water-stage recorder, operated with bottled nitrogen gas, and cable with stand-up cable car equipped for winch and heavy weights, located 2.7 miles above the confluence with the Rio Grande. This creek enters the Rio Grande at the lower end of Santa Helena Canyon, 371.6 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,200.64 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 78 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1932 through December 1959.

REMARKS: Irrigation diversions modify the flow of this spring-fed creek at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 34,900 second-feet on May 24, 1935, with a gage height of 17.59 feet on a gage .3 mile downstream. Min. no flow on September 29-30, 1937.

Average Flow in Second-Feet

Daily:	Max. 17,200	June 1, 1937	Min. " 0	Sept. 29-30, 1937
Monthly:	Max. 921	June 1937	Min. ".8	Oct. 1934
Yearly:	Max. 146	1937	Min. 5.5	1943

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.5	1.2	2.1	1.8	10.6	* 50.0	" 50.0	2.1	* 7.5	1.6	2.5	1.8
2	1.5	1.2	2.1	1.9	739	* 182	" 900	2.0	* 5.0	1.6	3.6	2.0
3	1.5	1.2	2.0	1.9	56.1	* 1,870	" 200	1.8	* 3.0	15.2	90.8	2.2
4	1.5	1.2	1.8	1.8	4.0	* 1,490	" 50.0	1.7	104	8.3	* 2.3	2.2
5	1.5	1.3	1.7	1.8	* 1.5	" 192	" 50.0	* 1.7	* 171	11.4	2.1	2.2
6	1.5	1.3	1.8	1.8	* 1.0	" 10.0	" 20.0	* 1.7	* 18.2	9.9	2.1	2.1
7	1.5	1.3	1.8	1.7	45.7	" 3.0	" 400	* 1.7	* 3.8	6.3	2.1	2.1
8	1.5	1.4	1.9	1.7	108	" 1.0	" 15.0	* 1.7	* 2.6	1.7	2.1	2.1
9	1.5	1.4	2.0	1.8	191	" 1.0	" 10.0	" 58.0	" 227	1.7	2.1	2.2
10	1.5	1.4	2.0	1.8	21.0	" 1.1	* 8.9	2.8	" 138	1.7	2.1	2.2
11	1.5	1.5	1.9	1.9	10.0	" 1.1	* 7.2	2.8	* 4.0	1.7	2.1	2.2
12	1.5	1.5	1.9	1.9	3.5	" 1.1	* 5.5	2.8	* 5.0	1.7	2.1	2.2
13	1.5	1.6	1.9	2.0	8.3	" 1.1	* 3.8	2.8	* 2.2	1.7	2.1	2.3
14	1.5	1.6	1.9	2.0	* 10.1	" 1.2	* 2.1	2.8	* 1.9	1.7	136	2.3
15	1.5	1.7	1.8	2.0	2.0	" 1.2	* 2.1	" 19.4	* 1.9	1.6	8.0	2.2
16	1.5	1.7	1.8	1.9	* 308	" 1.2	" 1,500	" 19.0	* 1.9	1.6	57.6	2.2
17	1.4	1.7	1.9	1.9	* 130	" 1.3	" 25.0	2.4	* 1.9	1.6	13.7	2.1
18	1.4	1.8	2.0	1.8	* 25.2	" 1.1	" 1,500	9.9	* 1.9	1.6	6.0	2.1
19	1.4	1.8	1.9	1.8	* 2.8	" 1.4	" 1,200	7.8	* 1.9	1.6	5.6	2.0
20	1.4	1.9	1.8	1.7	2.6	" 1.4	" 1,500	* 2.4	* 1.9	1.6	4.8	2.0
21	1.4	1.9	1.8	1.7	2.0	" 1.5	* 40.0	* 2.4	* 2.2	1.6	2.9	2.0
22	1.4	2.0	1.7	1.7	0.8	" 1.5	" 15.0	10.5	* 154	1.6	2.6	2.0
23	1.4	2.0	1.6	1.7	0.8	" 1.6	" 5.0	* 2.6	" 13.5	1.6	2.0	2.0
24	1.3	2.0	1.6	1.6	* 692	" 350	* 15.0	151	" 442	1.6	2.0	2.0
25	1.3	2.0	1.6	1.6	* 90.1	" 10.0	* 5.0	120	* 3.9	1.6	1.9	2.1
26	1.3	2.0	1.6	1.6	* 7.2	" 700	* 5.0	* 7.9	2.4	1.6	1.9	2.1
27	1.3	2.1	1.6	1.6	* 1.9	" 50.0	2.4	* 5.3	2.2	1.6	1.8	2.1
28	1.3	2.1	1.6	1.6	* 1.9	" 20.0	2.4	" 11.1	2.0	1.6	1.7	2.1
29	1.3		1.7	1.7	* 1.9	" 500	2.4	3.7	1.8	38.6	1.6	2.1
30	1.3		1.8	1.8	* 3.0	" 400	2.4	3.7	1.6	46.8	* 1.6	2.1
31	1.2		1.8	1.8	* 4.2	" 4.2	2.3	" 78.3	3.0			2.1
Sum	45.8		53.5		*5,847.0		" 543.8		177.0		65.4	
	44.1		56.4		*2,485.6		" 7,546.5		*1,330.2		369.8	

Current Year 1959

Month	Extreme Gage			Extreme Second-Feet			Average Second- Feet	Total Acre-Feet	Period 1932-1959				
	Extreme Gage		High	Extreme Second-Feet		Low			Average	Maximum	Minimum		
	Feet	Day		High	Day	Low							
Jan.	† 1	0	1.5	31	0	1.2	1.4	87.5	*	179	743		
Feb.	† 27	0	2.1	† 1	0	1.2	1.6	90.8		293	4,400		
Mar.	† 1	0	2.1	† 23	0	1.6	1.8	112	*	244	* 2,410		
Apr.	† 13	0	2.0	† 24	0	1.6	1.8	106	*	1,153	15,500		
May	6.52		2 * 2,580	† 22	0	.8	* 80.2	* 4,930	*	4,416	* 26,000		
June	9.21		3 * 9,300	† 8	0	1.0	* 195	* 11,600	*	6,467	54,800		
July	10.70		20 * 16,000	† 14	0	2.1	* 243	* 15,000	*	8,103	* 28,700		
Aug.	5.95		31 * 1,360	† 4	0	1.7	" 17.5	" 1,080	*	3,635	* 26,680		
Sept.	6.85		24 * 4,200	30	0	1.6	* 44.3	* 2,640	*	7,189	42,200		
Oct.	6.00		29 * 1,460	† 1	0	1.6	5.7	351	*	2,646	15,400		
Nov.	5.79		14 * 1,050	† 29	0	1.6	12.3	733	*	313	2,980		
Dec.			† 13	0	2.3	1	0	1.8	130	*	316		
Yearly	10.70		*16,000	0	.8	* 50.9	* 36,860.3	*	34,954	105,807	3,958.0		

^a Estimated * Partly estimated † And other days 0 Mean daily

RIO GRANDE AT JOHNSON RANCH, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located about 2 miles above Johnson Ranch, 14 miles below Castolon, Brewster County, Texas and Santa Elena Ranch, Chihuahua, and 392.9 river miles below the American Dam at El Paso, Texas. The zero of the gage is 2,045.30 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 76 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: April 1936 through December 1959.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 61,900 second-feet on September 27, 1958 with a gage height of 24.70 feet. An estimated 97,000 second-feet flow with a stage of 24.6 feet occurred at this station site on October 3, 1932. Min. zero several days in 1953, 1955 and 1958.

Average Flow in Second-Feet

Daily:	Max. 56,900	Sept. 10, 1942	Min. 0	Several days 1953, 1955 & 1958
Monthly:	Max. 23,600	Sept. 1942	Min. 0	May 1953
Yearly:	Max. 4,780	1942	Min. 167	1953

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	998	481	388	335	397	321	677	359	6,260	514	459	436
2	987	470	368	307	876	322	3,160	461	10,200	525	440	415
3	1,130	456	* 390	268	479	1,520	2,710	463	11,900	481	715	460
4	1,040	464	* 452	258	413	2,460	2,300	429	* 7,120	704	537	470
5	914	464	* 413	243	366	907	1,740	356	* 5,810	525	510	491
6	859	464	* 400	222	350	757	1,390	350	* 3,800	517	585	472
7	887	464	* 377	222	333	726	3,350	344	* 2,710	491	513	419
8	827	459	* 360	221	307	840	2,410	401	* 2,290	511	440	411
9	751	463	* 347	207	1,130	655	1,710	318	2,190	527	405	446
10	* 690	453	356	203	653	579	1,100	552	1,780	574	430	624
11	* 670	447	361	202	457	505	898	408	1,690	545	444	534
12	* 689	478	366	207	401	439	789	488	1,180	482	425	486
13	* 768	471	358	208	347	356	687	403	1,120	489	429	465
14	839	563	355	207	350	306	632	341	1,020	474	566	450
15	830	545	329	226	388	288	648	303	968	474	628	445
16	689	500	327	345	647	308	1,230	312	898	459	633	469
17	714	473	341	396	1,280	300	1,490	326	838	449	714	563
18	758	454	344	404	573	285	1,720	393	815	451	742	530
19	743	433	331	376	426	289	2,060	1,170	713	475	669	473
20	746	447	350	384	389	284	3,070	4,340	684	474	583	450
21	760	435	330	403	333	252	1,350	2,940	987	478	510	455
22	715	426	314	388	302	240	678	3,300	857	489	473	494
23	650	423	313	365	315	232	555	3,260	657	476	466	580
24	604	421	313	366	690	614	563	3,850	888	448	453	751
25	600	419	302	318	815	246	651	4,770	607	453	480	618
26	565	452	300	271	490	966	390	4,000	560	469	472	501
27	546	477	283	256	398	1,080	382	2,770	554	474	499	514
28	530	434	289	256	316	523	378	6,820	546	444	528	469
29	509	285	246	704	1,030	360	9,190	528	442	526	435	
30	498	297	253	560	972	406	5,750	510	693	464	475	
31	496	362	374			432	4,120		466		567	
Sum	12,936		8,563	18,602		63,287		15,473	15,428			
	23,002		10,701	15,859	39,916	70,680		15,738				
Current Year 1959												
Month	Extreme Gage Feet			Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Period April 1936-1959			
	High	Low	Day	High	Low	Day			Average	Maximum	Minimum	
High	Low	Day	Day			Acre-Feet						
Jan.	3.76	2.67	3	1,220	31	491	742	45,600	47,769	86,400	11,300	
Feb.	2.97	2.47	14	632	28	413	462	25,700	44,316	80,900	9,460	
Mar.	2.67	2.13	4	488	27	276	345	21,200	36,070	85,300	4,440	
Apr.	2.54	1.96	21	425	11	195	285	17,000	18,894	79,300	457	
May	4.67	2.13	17	2,030	1	253	512	31,500	42,875	240,000	0	
June	7.86	1.93	4	5,760	23	208	620	36,900	53,837	251,000	3,270	
July	8.33	2.32	16	7,420	29	336	1,290	79,200	116,955	620,000	5,930	
Aug.	9.59	2.15	29	11,200	9	279	2,040	126,000	120,083	485,000	12,300	
Sept.	10.88	2.62	3	13,700	30	503	2,360	140,000	266,539	1,404,000	9,350	
Oct.	3.50	2.47	30	1,250	29	426	499	30,700	192,123	1,157,000	4,940	
Nov.	3.27	2.47	3	1,010	9	405	525	31,200	59,745	164,000	8,600	
Dec.	3.08	2.44	24	825	8	390	498	30,600	49,179	110,000	9,510	
Yearly	10.88	1.93		13,700		199	850	615,600	1,048,385	3,461,400	120,747	

* Partly estimated

RIO GRANDE AT LANGTRY, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located at Langtry, Texas, 24.1 river miles above the confluence of the Pecos River and 614.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 1,091.69 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 45 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 to October 1914; December 1919 through March 1920; January 1924 through December 1959.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: The highest known gage height was 56.9 feet, which occurred about 3:00 P.M. on June 17, 1922. The discharge for this stage was 204,000 second-feet which was estimated by extension of the rating curve. The lowest recorded flow was 208 second-feet, which occurred July 12, 1953.

Average Flow in Second-Feet \$

Daily:	Max. 70,930	Oct. 5, 1932	Min. 216	June 17 & 18, 1953
Monthly:	Max. 23,700	Sept. 1942	Min. 263	May 1953
Yearly:	Max. 5,320	1942	Min. 450	1953

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
1	1,240	843	718	581	544	1,120	2,080	819	5,480	2,130	792	796		
2	1,210	826	727	571	925	1,360	2,590	728	4,740	3,280	914	845		
3	1,240	815	721	565	1,990	998	2,660	722	7,060	1,630	867	811		
4	1,230	811	697	599	1,600	1,550	2,330	730	10,400	10,200	821	778		
5	1,250	802	676	600	1,260	3,190	3,350	680	9,440	2,650	836	755		
6	1,360	793	673	588	905	3,630	*	2,300	766	6,720	1,360	937	747	
7	1,300	786	707	566	787	1,750	*	2,060	736	4,850	1,270	882	775	
8	1,210	795	714	546	714	1,420	*	1,970	699	*	4,100	1,090	852	781
9	1,160	798	690	524	674	1,110	*	3,100	676	*	3,600	1,020	867	810
10	1,170	802	681	510	666	1,940	2,880	660	*	3,760	981	875	772	
11	1,130	793	663	520	770	1,080	2,520	663	4,180	965	822	749		
12	1,090	791	646	536	1,000	959	1,760	678	3,080	965	785	739		
13	1,050	800	639	522	1,010	843	1,390	698	2,600	1,060	778	833		
14	1,030	798	636	515	802	756	1,210	760	1,920	1,010	819	877		
15	1,030	802	633	517	697	705	1,100	695	1,780	991	808	813		
16	1,060	817	630	518	737	687	1,380	793	1,670	1,030	850	764		
17	1,120	831	627	513	4,200	649	1,560	708	1,500	914	886	732		
18	1,120	872	621	500	1,780	607	1,390	657	1,450	887	938	729		
19	1,020	821	614	495	1,400	589	6,690	627	1,370	868	926	731		
20	1,010	797	608	561	1,510	582	10,200	4,060	1,290	856	988	809		
21	1,020	777	606	618	1,050	582	4,580	1,940	1,280	837	1,030	849		
22	992	770	605	621	837	564	3,740	3,820	1,400	842	973	813		
23	976	762	603	600	739	620	2,040	3,910	1,230	845	920	778		
24	990	770	617	602	793	978	1,530	*	3,810	1,870	834	853	750	
25	975	752	620	644	849	1,000	1,210	3,850	1,760	830	803	782		
26	946	761	604	646	702	626	1,050	*	3,930	1,420	818	770	829	
27	905	742	595	633	888	751	1,020	4,700	1,240	800	743	983		
28	884	725	592	628	1,130	832	1,010	4,170	1,070	775	740	920		
29	877		588	592	1,180	1,120	886	3,640	1,020	778	751	867		
30	858		590	563	1,220	1,320	795	7,150	2,840	807	785	832		
31	847		586	586	1,010	758	8,350	822				811		
Sum			22,252	16,994	33,938	66,825	44,145	24,860						
33,300			19,927	34,369	73,139	96,120	25,611							

Month	Current Year 1959			Period 1924-1959					
	Extreme Gage Feet		Extreme Second-Feet		Average	Total	Acre-Feet		
	High	Low	Day	Day	Second-Feet	Acres-Feet	Average	Maximum	Minimum
Jan.	1.93	1.27	6	1,410	31	847	1,070	66,100	79,952
Feb.	1.29	1.04	18	885	28	720	795	44,100	69,963
Mar.	1.08	.87	2	738	† 30	586	643	39,500	66,375
Apr.	1.00	.79	26	646	20	491	566	33,700	56,269
May	6.99	.84	17	7,700	1	529	1,110	68,200	88,918
June	5.60	.80	6	5,760	23	552	1,130	67,300	95,160
July	11.63	1.03	20	15,700	31	744	2,360	145,000	140,740
Aug.	7.95	.85	31	9,450	19	622	2,160	133,000	174,611
Sept.	9.30	1.30	4	11,700	30	980	3,200	191,000	307,582
Oct.	16.45	1.15	4	23,900	29	770	1,420	87,600	242,801
Nov.	1.53	1.15	21	1,040	28	733	854	50,800	90,017
Dec.	1.49	1.14	27	1,010	17	724	802	49,300	77,596
Yearly	16.45	.79		23,900		491	1,350	975,600	1,489,984
								3,851,500	326,100

* Partly estimated † And other days ‡ Period 1931-1959

PECOS RIVER NEAR SHUMLA, TEXAS

DESCRIPTION: Bubbler-type water-stage recorder, operated with bottled nitrogen gas, on top of rock ledge about 125 feet above river bed, and light cable, (winch-operated, for carrying current meter and light weights only), located 13.0 river miles upstream from the Pecos High Bridge and 18.5 river miles above the confluence with the Rio Grande. This confluence is 638.2 river miles below the American Dam at El Paso, Texas. On January 1, 1958 the zero of the gage was changed to 1,159.46 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 45 meter measurements made at low and medium stages during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: October 8, 1954, through December 1959 at this station. Records are also available for Pecos River near Comstock, 13.0 river miles downstream, from March 17 to December 3, 1898 and May 1900 through October 7, 1954.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. The flood of June 1954, which had a discharge of 98,000 second-feet at the gaging station near the railroad bridge 13 miles downstream, reached an elevation of 1,281.2 feet above mean sea level at this station.

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	219	199	199	176	157	211	201	367	218	6,300	375	284
2	223	205	193	173	179	210	192	348	209	3,340	366	285
3	225	206	194	168	186	225	181	337	200	1,040	356	283
4	226	207	191	169	192	230	173	330	200	19,900	346	280
5	225	204	198	169	237	240	171	315	201	4,220	340	280
6	226	204	194	175	236	546	163	299	199	1,530	345	281
7	222	204	193	179	223	428	164	292	194	1,160	377	276
8	224	205	195	184	200	299	184	288	194	958	351	280
9	223	205	199	178	397	247	176	304	195	852	337	279
10	221	208	198	176	393	229	168	280	226	799	328	275
11	217	208	200	184	262	215	167	270	219	748	327	277
12	216	200	198	196	231	202	180	263	201	711	326	277
13	215	200	195	200	208	192	174	254	199	716	322	276
14	219	203	194	188	192	186	162	244	200	715	362	268
15	219	206	194	185	185	184	153	240	201	651	353	289
16	221	203	189	185	188	183	150	233	197	617	338	282
17	217	203	184	180	185	185	289	224	193	590	338	281
18	216	202	184	176	234	180	758	221	192	563	322	274
19	216	199	179	174	251	169	1,720	220	191	542	315	268
20	215	198	179	172	216	159	5,830	221	192	498	304	264
21	220	197	179	171	204	151	2,280	223	193	478	299	260
22	214	196	177	169	191	144	1,260	216	194	462	295	253
23	208	192	177	174	202	624	822	218	193	451	290	248
24	204	189	179	165	202	609	696	224	190	445	283	241
25	206	193	183	160	208	208	655	237	189	436	288	237
26	206	205	180	160	233	316	517	234	186	421	286	238
27	208	218	176	162	201	376	456	228	185	412	285	237
28	204	209	176	164	234	271	424	220	181	398	282	230
29	198		175	157	315	232	404	212	180	389	281	227
30	197		175	156	269	217	387	212	7,270	387	279	232
31	197		178		235		375	218		381		248
Sum			5,668	5,225	7,868	7,992	51,110	9,696				
			6,667	5,805	7,046	19,632	12,982	8,210				
Current Year 1959												
Month	Extreme Gage Feet			Extreme Second-Feet		High	Low	Average	Total	Acre-Feet		
	High	Low	Day	High	Low					Day	Acre-Feet	Average
Jan.	1. 72	1.63	† 4	226	31	194	215	13,200	12,058	13,400	8,890	
Feb.	1. 69	1.56	26	222	24	189	202	11,200	11,036	12,200	9,880	
Mar.	1. 57	1.37	5	206	29	168	187	11,500	11,200	12,900	10,000	
Apr.	1. 54	1.23	13	210	30	154	174	10,400	15,702	39,900	8,040	
May	2.65	1.22	9	673	1	153	227	14,000	49,816	173,000	9,780	
June	7.42	1.20	23	5,620	22	140	262	15,600	19,224	41,300	5,820	
July	10.80	1.25	20	10,700	16	146	633	38,900	* 21,344	38,900	5,520	
Aug.	2.08	1.47	1	375	30	207	258	15,900	* 14,184	* 26,500	5,220	
Sept.	16.80		30	23,700	29	180	433	25,800	31,342	79,000	6,410	
Oct.	24.58	2.05	4	47,500	31	377	1,650	101,000	40,100	101,000	18,400	
Nov.	2.12	1.82	7	385	30	279	323	19,200	15,183	21,600	9,100	
Dec.	1. 84	1.60	† 2	292	29	224	265	16,300	13,050	16,300	9,100	
Yearly	24.58	1.20		47,500		140	405	293,000	254,239	390,670	114,790	

* Partly estimated † And other days Ø Mean daily

GOODENOUGH SPRING NEAR COMSTOCK, TEXAS

DESCRIPTION: Water-stage recorder, located 4,000 feet above the confluence with the Rio Grande and 11.75 miles southwest of Comstock, Val Verde County, Texas. The stream from this spring enters the Rio Grande 664.9 river miles below the American Dam at El Paso, Texas. The zero of the gage is 967.42 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 35 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. From June 23, 1946, when recorder installation became inoperable, to October 12, 1954, discharges were estimated between measurements. Prior to June 23, 1946, records were based on continuous records of gage heights. Records available: January 1924 through December 1959.

REMARKS: The flow of this spring is very uniform and not modified by diversions or storage. Backwater reaches the station when a discharge of approximately 35,000 second-feet occurs in the Rio Grande at the confluence. A maximum gage height of 43.35 feet was reached by backwater on June 28, 1954.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,210 second-feet on October 3, 1959 with a gage height of 6.62 feet. Min. 65.8 second-feet on February 27, 1957.

Average Flow in Second-Feet

Daily:	Max. * 651	Oct. 10, 1958	Min. 66.8	March 1, 1957
Monthly:	Max. * 421	Oct. 1932	Min. * 69.4	Feb. 1957
Yearly:	Max. 266	1933	Min. * 83.1	1952

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	232	209	213	206	205	204	248	217	205	229	239	203
2	229	210	215	207	223	205	256	216	205	240	239	202
3	231	212	214	207	232	205	254	215	205	278	235	202
4	232	213	215	207	233	205	251	213	205	340	232	202
5	233	211	214	208	244	205	242	212	206	392	230	200
6	235	212	214	209	232	227	237	211	206	375	227	200
7	236	213	215	209	224	233	235	211	206	351	226	199
8	236	213	215	209	221	227	232	210	205	338	224	198
9	235	214	216	209	228	224	229	209	205	326	222	197
10	234	215	217	209	236	220	229	206	205	316	224	197
11	234	215	215	211	234	218	225	205	205	305	223	196
12	234	216	216	210	228	218	224	206	204	292	221	196
13	234	217	217	209	223	213	221	207	204	322	216	195
14	235	218	215	209	221	211	220	207	205	332	214	194
15	234	219	211	209	218	211	219	207	205	314	212	192
16	230	218	210	209	218	210	219	208	204	298	211	194
17	229	219	207	209	215	208	217	207	205	286	210	192
18	227	219	206	208	214	207	218	207	204	278	208	190
19	228	216	208	214	213	204	224	207	204	270	208	190
20	226	215	210	213	210	203	238	207	205	263	207	190
21	223	215	209	210	210	203	230	206	205	257	206	189
22	221	215	212	209	209	202	226	205	206	252	206	190
23	218	213	213	207	208	207	226	205	206	250	206	190
24	217	213	214	207	210	201	226	205	206	245	206	188
25	215	212	215	207	209	202	225	206	205	242	206	189
26	214	213	214	206	208	199	225	206	205	238	205	187
27	211	213	213	205	208	195	224	205	205	234	203	186
28	210	213	212	205	207	194	223	205	203	233	203	185
29	207		211	204	207	192	221	205	203	232	203	184
30	208		210	202	205	193	219	205	205	230	203	183
31	208		209		205		218	206		231		183
Sum		6,001	6,595	6,243	6,758	6,246	7,101	6,447	6,147	8,789	6,475	5,983

Current Year 1959

Month	Extreme Gage Feet			Extreme Second-Feet			Average Second-Feet	Total	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
	Jan.	2.07	1.93	8	237	29	207	226	13,900	7,807	19,620
Feb.	1.95	1.83	115	219	1	209	214	11,900	6,939	17,030	3,860
Mar.	1.86	1.78	10	218	18	206	213	13,100	7,574	17,770	4,340
Apr.	1.80	1.73	19	215	30	202	208	12,400	7,396	16,580	4,820
May	2.38	1.74	24	284	1	203	218	13,400	8,124	16,840	* 4,870
June	3.88	1.76	23	512	30	189	208	12,400	* 8,083	16,040	* 4,470
July	2.88	1.95	19	350	18	216	229	14,100	* 8,559	16,460	* 4,500
Aug.	1.95	1.77	1	218	23	203	208	12,800	* 8,193	15,840	4,840
Sept.	1.80	1.71	30	212	29	202	205	12,200	* 9,122	25,000	* 5,120
Oct.	6.62	1.80	3	1,210	1	213	284	17,400	* 9,577	25,870	4,820
Nov.	2.02	1.66	1	242	27	202	216	12,800	8,510	21,850	4,540
Dec.	1.67	1.47	1	204	31	182	193	11,900	8,298	20,470	4,500
Yearly	6.62	1.47		1,210		182	219	158,300	* 98,182	192,840	* 60,320

^a Estimated * Partly estimated † And other days Ø Mean daily

DEVILS RIVER NEAR MOUTH

DESCRIPTION: Water-stage recorder and rock and concrete low-flow station control, located 3.7 river miles downstream from U. S. 90 Highway bridge and .8 mile above the confluence with the Rio Grande. This confluence is 680.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 911.00 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 32 meter measurements by wading during the year, a continuous record of gage heights, and a stable rating curve for discharges up to 600 second-feet; above 600 second-feet, and when affected by backwater from the Rio Grande, records are based on discharges at a station 3.7 miles upstream. Records available: August 1954 through December 1959. Records are also available from May 1900 to March 1914 for point .9 mile upstream; from December 1923 to September 1, 1932 for a site 1.9 miles upstream; and from September 2, 1932 through August 31, 1957, for a station 3.7 miles upstream; and from August 7, 1954 to January 31, 1958 at a site 30.1 miles upstream. A graph of Devils River flow from 1871 through 1939 may be found in Water Bulletin No. 9.

REMARKS: The monthly flow of this spring-fed stream is not modified, but the daily flow is modified by two power dams, with a combined hydroelectric generating capacity of 3,100 kva, the operation of which began in 1929. During the flood of June 1954, the peak flow of Devils River, affected by backwater from the Rio Grande, reached an elevation of 969.00 feet at the steam electric plant, located approximately 2,000 feet upstream from this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. * 86,500 second-feet on September 24, 1955, with a gage height of 21.02 feet. Min. 51.9 second-feet on February 7, 1957, with a gage height of .70 foot. Extreme flow data for Devils River prior to 1954 may be found in previous water bulletins.

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	652	644	607	528	519	481	525	555	482	8,020	744	537
2	631	651	605	516	745	537	526	551	478	2,990	647	549
3	642	632	608	516	598	494	517	517	457	1,300	632	543
4	642	629	594	508	563	488	476	506	445	3,510	629	555
5	637	645	621	515	507	514	456	514	414	9,950	645	511
6	652	625	517	523	529	666	481	519	421	1,880	567	553
7	658	634	575	531	499	523	404	516	408	995	541	517
8	663	637	592	548	475	496	473	511	431	780	572	548
9	652	636	591	538	498	526	423	515	401	640	573	565
10	652	630	577	517	622	495	434	499	440	606	565	539
11	642	620	586	548	595	508	429	509	451	606	573	513
12	637	618	545	567	566	413	455	508	419	592	583	522
13	652	613	572	531	528	554	426	487	420	1,070	575	526
14	658	618	571	551	523	510	418	465	418	3,330	606	522
15	668	587	584	520	512	410	396	492	401	902	589	539
16	631	586	570	500	960	434	395	499	412	702	590	552
17	626	597	574	509	696	438	385	491	408	657	569	535
18	626	604	562	518	603	373	407	401	387	603	564	538
19	626	584	549	504	584	384	452	534	397	590	576	519
20	647	586	558	517	534	388	694	482	398	598	567	533
21	679	588	545	508	565	377	1,720	464	405	590	579	530
22	604	591	503	491	509	354	934	510	392	590	551	534
23	608	602	525	490	580	388	681	479	392	590	571	537
24	612	568	542	465	653	511	612	512	414	596	531	532
25	612	553	546	454	622	632	590	523	402	576	561	530
26	617	596	543	462	590	1,040	581	519	413	542	555	533
27	652	616	543	513	569	681	569	493	402	550	520	549
28	617	642	539	514	539	628	560	499	408	547	515	510
29	619	522	477	527	577	557	489	406	562	535	525	
30	612	518	461	500	542	549	487	400	578	530	528	
31	622	528	491	550	486	550	486	588				540
Sum	17,132	15,340	15,362	15,362	15,362	15,362	15,362	15,532	46,630	16,564		
	19,748	17,412	17,801	17,801	17,801	17,801	17,801	17,075	12,522	17,355		

Current Year 1959

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High		Low	High				Average	Maximum	Minimum		
	High	Low	Day	Day	Day			Day	Day	Day		
Jan.	2.72	2.44	21	746	22	599	637	39,200	24,140	39,200	9,700	
Feb.	2.57	2.28	5	677	24	516	612	34,000	22,910	38,000	8,950	
Mar.	2.53	1.42	21	637	6	219	562	34,500	22,260	34,500	10,400	
Apr.	2.43	1.62	2	581	13	267	511	30,400	* 23,440	30,400	12,600	
May	4.13	1.68	16	1,780	20	294	574	35,300	* 88,460	347,000	11,500	
June	3.81	1.40	26	1,490	23	206	512	30,500	51,360	127,000	10,100	
July	4.99	1.49	21	2,620	17	222	551	33,900	27,222	34,700	9,710	
Aug.	2.47	1.60	23	597	18	262	501	30,800	25,927	32,100	9,760	
Sept.	2.38	1.78	1	543	18	281	417	24,800	* 48,158	* 118,000	9,650	
Oct.	2.20	5	9,950	26	487	1,500	92,500	* 49,383	92,500	* 13,600		
Nov.	2.87	2.18	1	837	27	490	578	34,400	28,017	41,900	10,100	
Dec.	2.46	1.97	+14	601	11	400	534	32,900	* 26,830	40,800	9,980	
Yearly		1.40	9,950	206	626	453,200	*	438,107	*	718,350	145,600	

^a Estimated * Partly estimated † And other days Ø Mean daily

RIO GRANDE BELOW AMISTAD DAM SITE

DESCRIPTION: Bubbler-type water-stage recorder, operated with bottled nitrogen gas, and cable with stand-up cable car equipped for winch and heavy weights, located 10.5 river miles above the international highway bridge between Del Rio, Texas and Cd. Acuña, Coahuila, 2.9 river miles below the confluence of the Devils River, and 683.0 river miles below the American Dam at El Paso, Texas. The zero of the gage is 893.79 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 52 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: September 1, 1954 through December 31, 1959. Records are also available from May 1900 to April 1915 for a station 1.9 miles upstream; from December 1919 to March 1920 for a station 1.6 miles downstream near McKee's Switch; from December 1923 to July 2, 1941 for a station approximately 10.3 miles downstream and from July 2, 1941 through August 1954 for the station at the international highway bridge 10.5 miles downstream.

REMARKS: Reservoirs, diversions, and drainage and power plant returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: The flood of June 1954 reached a peak gage height of 55.72 feet and a maximum discharge of 1,158,000 second-feet, determined by slope-area computation. This is the greatest rate of discharge recorded at any point on the Rio Grande and is equivalent to a discharge of 133 second-feet per square mile from the 8,718 square mile flood-producing storm area which included the watersheds of the Pecos River below Sheffield, the Devils River, and the Rio Grande beginning above Osman Canyon near Langtry, except that in Mexico it included only 543 square miles of storm-affected watershed.

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,510	2,110	1,940	1,710	1,700	2,050	2,730	2,230	8,320	14,700	2,730	2,010
2	2,490	2,120	1,900	1,690	2,320	2,220	3,510	2,240	5,910	14,300	2,450	2,030
3	2,540	2,080	1,910	1,670	2,080	2,410	3,830	2,040	6,010	7,060	2,500	2,050
4	2,520	2,040	1,890	1,680	3,150	2,200	3,620	2,010	9,270	21,000	2,420	2,030
5	2,470	2,060	1,900	1,680	3,130	2,890	3,880	2,030	11,600	36,600	2,370	1,960
6	2,520	2,040	1,750	1,690	2,440	6,610	4,030	1,960	8,910	6,770	2,230	1,990
7	2,620	2,010	1,810	1,710	1,970	4,360	3,600	2,030	6,760	4,270	2,270	1,970
8	2,550	2,010	1,880	1,710	1,800	3,160	3,250	2,000	5,740	3,500	2,240	2,060
9	2,490	2,010	1,920	1,680	1,690	2,670	3,100	1,960	5,050	3,080	2,190	2,070
10	2,470	2,020	1,860	1,620	1,880	2,420	4,190	1,920	4,840	2,930	2,180	2,070
11	2,440	2,010	1,870	1,680	2,000	2,960	3,840	1,900	5,410	2,870	2,170	1,970
12	2,400	1,990	1,790	1,690	1,950	2,170	3,500	1,880	4,300	2,840	2,100	1,970
13	2,450	1,980	1,770	1,640	2,070	2,430	2,900	1,900	4,000	7,230	2,060	1,980
14	2,410	1,980	1,760	1,670	2,120	2,200	2,460	1,830	3,540	6,630	2,140	2,060
15	2,380	1,970	1,780	1,620	1,850	1,870	2,180	1,940	2,940	3,450	2,160	1,50
16	2,260	1,940	1,760	1,590	3,050	1,800	2,050	1,910	2,810	3,000	2,130	2,120
17	2,290	1,980	1,790	1,610	3,530	1,750	2,400	2,000	2,690	2,880	2,150	2,000
18	2,370	1,990	1,750	1,620	4,360	1,640	2,960	1,790	2,470	2,660	2,160	1,950
19	2,370	2,010	1,730	1,600	3,180	1,590	4,490	1,840	2,380	2,570	2,190	1,940
20	2,340	1,970	1,730	1,640	3,080	1,560	14,700	2,010	2,400	2,550	2,170	1,950
21	2,360	1,950	1,800	1,650	2,860	1,540	15,800	4,710	2,300	2,520	2,250	2,010
22	2,300	1,940	1,740	1,700	2,240	1,520	7,300	3,450	2,230	2,490	2,270	2,040
23	2,280	1,950	1,700	1,700	2,230	1,540	5,390	4,280	2,390	2,470	2,270	2,000
24	2,280	1,940	1,740	1,640	2,240	4,330	4,060	4,880	2,250	2,440	2,170	1,940
25	2,280	1,900	1,750	1,620	2,090	3,320	3,320	4,850	2,890	2,390	2,130	1,900
26	2,270	1,940	1,760	1,630	2,020	3,900	2,960	4,560	2,780	2,330	2,070	1,940
27	2,280	1,980	1,750	1,710	1,900	2,520	2,880	5,210	2,360	2,320	1,970	2,030
28	2,220	2,000	1,740	1,700	2,070	2,230	2,810	5,210	2,180	2,660	1,960	2,170
29	2,150	1,700	1,650	2,270	2,190	2,700	4,440	2,010	2,250	1,960	2,160	
30	2,130	1,710	1,580	2,300	2,460	2,510	5,200	1,990	2,270	1,970	2,080	
31	2,090	1,690			2,270	2,320	8,720	2,290	2,290	2,070		
Sum	55,920	49,780	76,510	94,930	176,920	62,670						
	73,530	55,570	73,840	129,270	128,730	66,030						

Month	Current Year 1959			Period Sept. 1954-1959			
	Extreme Gage Feet		High	Extreme Second-Feet		Average Second-Feet	Total Acre-Feet
	High	Low		Day	Day		
Jan.	2.82	2.40	7	2,670	31	2,080	2,370 146,000 93,440 146,000 66,100
Feb.	2.44	2.23	1	2,130	25	1,870	2,000 111,000 85,680 111,000 71,000
Mar.	1.87	1.87	1	1,940	6	1,420	1,790 110,000 80,360 110,000 66,800
Apr.	2.12	1.83	7	1,780	13	1,380	1,660 98,700 * 96,460 * 208,000 54,100
May	4.67	1.95	17	6,630	1	1,570	2,380 146,000 * 256,340 * 812,000 60,700
June	6.08	1.73	6	10,300	22	1,320	2,550 152,000 154,960 248,000 56,800
July	9.25	2.24	21	22,400	17	1,850	4,170 250,000 136,820 256,000 46,000
Aug.	5.65	1.93	31	10,300	20	1,570	3,060 188,000 151,100 279,000 67,500
Sept.	6.30	2.11	5	12,100	30	1,770	4,290 255,000 292,983 759,000 71,900
Oct.	17.25	2.32	5	64,200	29	2,170	5,710 351,000 427,500 1,487,000 135,000
Nov.	2.80	2.20	1	2,990	30	1,890	2,200 131,000 130,850 281,000 68,200
Dec.	2.42	2.10	29	2,270	25	1,760	2,020 124,000 104,217 166,000 65,200
Yearly	17.25	1.73		64,200		1,320	2,860 2,068,700 2,010,710 3,537,200 858,900

* Partly estimated # Mean daily

ARROYO LAS VACAS NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car, and control wall with notch opening capacity of 777 second-feet, located 1.5 miles upstream from Cd. Acuña, Coahuila and 1.8 miles upstream from the confluence of Arroyo Las Vacas with the Rio Grande. This confluence is just above the Del Rio-Cd. Acuña International Bridge, and 693.5 river miles below the American Dam at El Paso, Texas. The zero of the gage is 885.82 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 114 meter measurements during the year, a stable rating curve up to 777 second-feet, and a continuous record of gage heights. Computations by shifting channel methods for flows above notch capacity. Records available: Occasional estimates from June 1935 to March 19, 1938 and continuous records from March 20, 1938 through December 1959.

REMARKS: The low flow of this stream is from springs and is modified by irrigation diversions upstream. The reinforced concrete control wall, 52 feet downstream from the recorder, was built in January 1955 and the zero of the gage was changed to coincide with the notch elevation. On June 28, 1954 backwater from the Rio Grande reached an elevation of 902.49 feet at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 25,780 second-feet with a gage height of 16.14 feet on September 30, 1954. Min. no flow several occasions September and December 1956, and January 1957.

Average Flow in Second-Feet †

Daily:	Max. 4,030	Apr. 28, 1957	Min. 0	Several days Dec. 1956 & Jan. 1957
Monthly:	Max. 279	Apr. 1957	Min. .4	Several months 1952, 1953 & 1954
Yearly:	Max. 44.1	1954	Min. 2.8	1952

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.6	10.6	10.6	10.6	230	10.6	10.6	3.9	3.9	3.9	6.7	6.7
2	10.6	14.8	10.6	10.6	153	10.6	10.6	3.9	3.9	3.9	6.7	6.7
3	10.6	14.8	10.6	10.6	24.4	10.6	10.6	3.9	3.9	12.0	6.7	6.7
4	10.6	14.8	10.6	10.6	19.4	10.6	6.7	3.9	3.9	160	3.9	6.7
5	10.6	14.8	10.6	10.6	14.8	38.8	6.7	3.9	3.9	19.4	3.9	6.7
6	10.6	10.6	10.6	10.6	14.8	50.9	6.7	3.9	3.9	10.6	3.9	6.7
7	10.6	14.8	10.6	10.6	14.8	10.6	6.7	3.9	3.9	6.7	3.9	6.7
8	10.6	14.8	10.6	10.6	14.8	6.7	6.7	3.9	3.9	6.7	3.9	6.7
9	10.6	19.4	10.6	10.6	14.8	6.7	6.7	3.9	3.9	6.7	3.9	6.7
10	10.6	14.8	10.6	14.8	14.8	6.7	3.9	3.9	3.9	6.7	3.9	6.7
11	10.6	14.8	10.6	19.4	10.6	6.7	3.9	3.9	6.7	3.9	3.9	6.7
12	10.6	10.6	10.6	14.8	10.6	6.7	3.9	3.9	3.9	3.9	3.9	3.9
13	10.6	14.8	14.8	14.8	10.6	3.9	3.9	3.9	3.9	196	3.9	3.9
14	10.6	10.6	10.6	14.8	10.6	3.9	3.9	3.9	3.9	29.7	6.7	6.7
15	10.6	10.6	6.7	14.8	10.6	3.9	3.9	3.9	3.9	10.6	6.7	3.9
16	10.6	10.6	10.6	10.6	710	3.9	3.9	3.9	3.9	6.7	6.7	3.9
17	10.6	10.6	10.6	10.6	35.7	3.9	3.9	3.9	3.9	6.7	3.9	3.9
18	10.6	6.7	10.6	10.6	24.4	3.9	10.6	3.9	3.9	6.7	3.9	3.9
19	10.6	10.6	10.6	14.8	19.4	3.9	30.0	3.9	3.9	6.7	3.9	3.9
20	10.6	10.6	6.7	10.6	19.4	3.9	29.3	3.9	3.9	6.7	3.9	3.9
21	6.7	10.6	10.6	10.6	19.4	3.9	10.6	3.9	3.9	6.7	3.9	3.9
22	6.7	10.6	10.6	10.6	23.7	3.9	6.7	3.9	3.9	3.9	3.9	3.9
23	10.6	10.6	10.6	10.6	41.7	55.4	6.7	26.8	3.9	6.7	3.9	3.9
24	10.6	6.7	10.6	10.6	19.4	438	3.9	10.6	19.4	3.9	3.9	3.9
25	10.6	6.7	10.6	10.6	14.8	169	3.9	6.7	10.6	3.9	3.9	6.7
26	10.6	10.6	6.7	10.6	14.8	35.3	3.9	6.7	3.9	3.9	3.9	6.7
27	10.6	10.6	6.7	10.6	19.4	3.9	3.9	3.9	3.9	6.7	3.9	3.9
28	10.6	10.6	6.7	10.6	14.8	3.9	3.9	3.9	3.9	3.9	3.9	3.9
29	10.6	6.7	6.7	10.6	14.8	3.9	3.9	3.9	3.9	3.9	3.9	3.9
30	10.6	10.6	10.6	10.6	14.8	3.9	3.9	3.9	3.9	3.9	3.9	3.9
31	10.6	10.6	10.6	10.6	10.6	3.9	3.9	3.9	6.7	3.9	3.9	3.9
Sum	320.8	331.7	309.4	344.2	1,564.3	976.7	228.3	156.1	142.0	565.5	133.8	160.1

Month	Current Year 1959			Period 1938-1959					
	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	Day			Average	Maximum	Minimum
Jan.	.16	.10	7	14.8	21	6.7	10.3	636	351
Feb.	.20	.10	9	19.4	17	6.7	11.8	658	5,950
Mar.	.16	.10	13	14.8	14	6.7	10.0	614	2,600
Apr.	.30	.10	11	35.7	28	6.7	11.5	683	1,637
May	4.43	.10	16	3,430	15	6.7	50.5	3,100	1,892
June	2.89	.07	23	1,650	12	3.9	32.6	1,940	1,388
July	1.15	.07	19	385	10	3.9	7.4	452	1,207
Aug.	.82	.07	23	237	1	3.9	5.0	309	697
Sept.	.69	.07	24	164	1	3.9	4.7	281	1,683
Oct.	1.97	.07	4	848	1	3.9	18.2	1,120	8,230
Nov.	.10	.03	1	6.7	25	1.4	4.5	265	1,318
Dec.	.10	.03	1	6.7	27	1.4	5.2	317	297
Yearly	4.43	.03	3,430	1,4	14.3	10,374	12,134	31,995.7	2,066.7

^u Estimated ^t And other days [†]Period 1938-1959

SAN FELIPE CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Bubbler-type water-stage recorder, operated with bottled nitrogen gas, and cable with stand-up cable car equipped for winch and heavy weights, at Silos Farm Road bridge 1.75 miles south of Del Rio, Texas, and 2 miles above the confluence with the Rio Grande. This stream enters the Rio Grande 695.1 river miles below the American Dam at El Paso, Texas and 12.1 river miles below the gaging station on the Rio Grande below Diablo Dam Site. The zero of the gage is 877.43 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 45 meter measurements during the year, and a continuous record of gage heights. Computations by shifting channel methods. Records available: September 1, 1931 through December 1959.

REMARKS: Municipal diversions at Del Rio and irrigation diversions greatly modify the flow of this spring-fed creek at this station. Backwater from the Rio Grande reaches this station when the Rio Grande near Del Rio reaches a stage of 15 feet, or a flow of about 60,000 second-feet. On June 28, 1954 combined creek flow and backwater from the Rio Grande reached a stage of 24.51, the highest of record, at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 45,000 second-feet on June 14, 1935, with a gage height of 23.20 feet. Min. .4 second-foot on July 20, 1953.

Average Flow in Second-Feet

Daily:	Max. ^u 16,200	June 14, 1935	Min. 1.5	July 21, 1953
Monthly:	Max. * 805	June 1935	Min. 4.6	July 1953
Yearly:	Max. * 136	1935	Min. 25.1	1953

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	103	110	89.1	93.0	382	93.3	99.0	84.9	88.8	88.5	123	102
2	103	109	86.4	88.8	266	93.1	94.3	89.0	89.3	90.0	115	99.6
3	103	109	86.4	88.3	104	90.3	96.4	87.8	87.8	113	117	103
4	102	110	95.5	87.9	103	96.7	103	88.1	90.1	209	115	104
5	102	112	109	92.6	106	99.0	109	90.7	89.9	99.9	113	106
6	102	113	111	106	108	133	105	103	88.6	109	114	113
7	100	113	113	163	110	96.6	104	112	102	120	114	115
8	102	110	112	199	108	96.7	104	111	113	116	114	116
9	103	108	111	127	108	102	107	112	112	116	115	117
10	105	108	107	133	108	102	105	112	114	114	114	116
11	107	105	104	143	106	102	105	108	114	111	116	112
12	110	107	111	112	102	103	106	107	115	106	123	114
13	112	104	111	109	104	104	102	106	114	197	123	114
14	114	99.6	105	108	103	100	101	106	107	116	126	113
15	113	105	93.6	102	98.0	89.6	89.3	93.7	87.7	113	126	112
16	114	106	90.3	104	111	84.6	82.4	91.0	85.0	112	124	110
17	113	102	90.7	105	101	83.4	84.7	87.1	86.3	111	127	108
18	112	98.5	92.4	105	98.7	84.5	129	88.1	87.4	111	127	112
19	111	101	93.3	105	96.1	83.1	159	94.3	84.6	111	127	108
20	110	103	105	105	96.3	88.0	185	104	93.3	111	126	107
21	109	111	118	109	102	95.7	106	108	98.5	108	125	107
22	108	116	121	106	102	88.9	110	105	99.7	108	123	106
23	109	111	120	104	188	94.4	115	114	101	107	114	99.9
24	110	103	118	104	114	174	118	113	107	106	107	104
25	110	103	115	103	116	176	119	115	108	108	105	112
26	107	103	113	103	115	150	119	114	103	108	108	112
27	107	98.5	112	101	118	113	116	109	98.1	107	112	118
28	109	97.1	117	101	118	115	114	108	97.0	109	112	116
29	109	119	99.9	115	116	112	107	101	111	112	113	
30	108	112	93.7	111	114	108	109	97.5	109	113	113	116
31	105	99.0		102			95.4	98.8	168			
Sum	2,975.7	3,301.2			3,161.9			3,176.5		3,623.4		3,418.5
	3,332	3,280.7		3,820.1		3,402.5		2,960.6		3,530		

Current Year 1959

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total	Acre-Feet			Period Sept. 1931-1959
	High		Low	Day	Day			Average	Maximum	Minimum	
	High	Low	Day	Day	Day	Day	Day	Average	Maximum	Minimum	
Jan.	1.82	1.63	†14	0	114	7	0	107	6,610	3,809	7,070
Feb.	1.80	1.56	†22		120	28	87.9	106	5,900	2,948	8,630
Mar.	1.83	1.47	23		128	16	81.8	106	6,510	2,651	6,510
Apr.	5.77	1.43	8	1,540	2	77.0	110	6,550	3,137	10,400	566
May	8.26	1.58	1	3,460	15	88.6	123	7,580	4,676	17,600	739
June	4.26	1.47	24	780	19	77.2	105	6,270	5,223	* 47,900	301
July	5.90	1.52	19	1,610	15	75.0	110	6,750	3,296	* 8,800	285
Aug.	1.83	1.47	8	129	17	78.6	102	6,300	2,994	6,300	350
Sept.	1.81	1.44	10	124	2	77.4	98.7	5,870	4,232	19,100	872
Oct.	4.65	1.52	13	951	1	84.7	117	7,190	4,175	8,470	1,000
Nov.	2.15	1.67	1	174	25	103	118	6,700	3,296	7,000	526
Dec.	1.85	1.56	31	131	2	91.7	110	6,780	3,297	6,780	496
Yearly	8.26	1.43		3,460		77.0	110	79,310	43,734	* 98,137	18,201

^u Estimated * Partly estimated † And other days Ø Mean daily

RIO GRANDE BELOW MAVERICK DAM

DESCRIPTION: Water-stage recorder located 4.7 miles below the Maverick Irrigation District diversion dam, 30.0 miles above the Maverick Hydro Plant and 716.7 river miles below the American Dam at El Paso, Texas. The zero of the gage is at 804.79 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 48 meter measurements, by wading, during the year, 47 by the Mexican and 1 by the United States Section of this Commission. Computation by shifting channel methods. There are no facilities for measuring high flows at this station. Records available: January 1, 1956 through December 31, 1959.

REMARKS: This station was placed in operation on November 26, 1955. Irrigation diversions 5.9 miles upstream largely control the flow at this station.

EXTREME FLOWS FROM RECORDS: Maximum flow not recorded. Min. 2.8 second-feet several days June, July and August 1956.

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,320	971	788	625	473	848	1,480	908			1,370	830
2	1,320	971	724	565		908		908			1,240	865
3	1,320	939	724	537	908	908		848			1,120	865
4	1,320	908	724	537	1,390	1,040		759			1,090	904
5	1,320	908	689	512		727		724			1,010	830
6	1,320	908	689	565	1,320			724			939	759
7	1,440	908	565	593	1,110			689			939	795
8	1,440	876	657	943	848			1,930	724	2,540	1,010	830
9	1,360	876	724	593		1,390	1,740	689		2,030	975	865
10	1,320	876	724	512	819	1,180	2,120	625		1,670	939	939
11	1,320	848	689	593	971			593		1,540	975	830
12	1,250	848	657	593	848	971	2,210	565		1,450	939	830
13	1,250	819	625	593	848	992	1,700	565			904	830
14	1,210	819	657	537	1,030	848	1,290	512	2,210		865	865
15	1,180	819	657	565	819		1,070	593	1,610	2,660	939	1,010
16	1,180	819	657	512				908	565	1,320	1,670	939
17	1,110	848	657	487				908	565	1,210	1,590	904
18	1,180	819	657	487				1,360	565	1,110	1,410	904
19	1,210	848	657	512	2,020			2,020	463	1,030	1,320	1,010
20	1,180	848	689	487	1,440			971	512	1,071	1,280	865
21	1,180	819	689	463	1,480					908	1,240	1,010
22	1,140	819	593	512	1,140					848	1,200	1,090
23	1,110	819	625	537	1,070					908	1,160	1,090
24	1,110	788	689	537	908					971	1,160	1,010
25	1,110	724	724	487	939					1,210	1,160	939
26	1,110	788	759	512	908					1,290	1,050	904
27	1,110	819	724	537	788					1,250	1,050	830
28	1,030	848	657	593		1,250	1,320			908	1,010	975
29	1,000		657	537	939	1,180	1,180			819	1,010	795
30	971		625	487	971	1,140	1,140			1,010	795	1,010
31	971		625		1,030		971			1,050		1,050
Sum		23,900		16,550							28,122	
	37,392		20,977								29,279	

Current Year 1959

Period #1956-1959

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet				
	Extreme Gage Feet			High	Low			Average	Maximum	Minimum		
	High	Low	Day									
Jan.	2.69	2.20	7	1,480	31	939	1,210	74,210	32,298	74,210	7,570	
Feb.	2.23	1.97	† 1	971	25	724	854	47,400	32,347	47,400	19,720	
Mar.	2.10	1.61	1	848	7	410	677	41,600	22,718	41,600	11,420	
Apr.	2.49	1.64	8	1,250	† 4	438	552	32,830	14,833	32,830	2,480	
May	4.69	1.64	18			1	438					
June	9.19	1.31	25			23	240					
July	8.83	2.03	21			17	788					
Aug.	5.77	1.54	31			19	371					
Sept.	6.63	1.84	5			30	593					
Oct.	14.53	1.84	5			1	593					
Nov.	2.56	1.87	1	1,590	† 29	759	976	58,100	40,843	58,100	14,860	
Dec.	2.26	1.77	29	1,200	5	671	907	55,820	48,600	96,660	9,910	
Yearly	14.53	1.31				240						

† And other days # Some months missing

PINTO CREEK NEAR DEL RIO, TEXAS

DESCRIPTION: Bubbler-type water-stage recorder, operated with bottled nitrogen gas, on top of a ledge 45 feet above the creek bed, a solid rock and concrete station control, and a cable with stand-up cable car equipped for winch and heavy weights, located 1.6 miles above the confluence with the Rio Grande. This creek enters the Rio Grande 718.1 river miles below the American Dam at El Paso, Texas. The zero of the gage is 813.68 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 50 meter measurements during the year and a continuous record of gage heights. Records available: September 1955 through December 1959 at this station and November 22, 1928 through August 1955 at a site 3.9 miles upstream.

REMARKS: Small irrigation diversions modify the flow of this spring-fed creek at this station. When flow in the Rio Grande at the confluence of this creek exceeds about 80,000 second-feet, backwater may reach this station. Backwater from the Rio Grande flood of June 1954 reached a gage height of 28.8 feet, or an elevation of 842.50 at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 186,000 second-feet on June 24, 1948 with a gage height of 32.0 feet. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max. * 28,200	June 24, 1948	Min. 0	Frequently
Monthly:	Max. * 953	June 1948	Min. 0	Frequently
Yearly:	Max. 105	1932	Min. 1.8	1945

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	38.0	35.6	36.1	28.5	63.2	32.4	80.4	51.6	37.5	40.2	51.6	41.3
2	38.0	36.1	35.6	27.2	91.8	31.7	76.8	50.2	37.5	40.2	51.6	41.3
3	39.1	36.6	35.1	27.5	37.5	30.2	73.6	50.2	37.5	39.1	48.9	40.2
4	40.2	37.0	34.2	27.5	30.5	30.2	68.7	48.9	37.5	50.2	48.9	39.1
5	40.2	37.0	33.7	27.2	29.8	30.2	67.1	46.7	37.0	50.2	48.9	40.2
6	40.2	35.6	32.8	27.2	29.1	33.7	63.9	46.7	36.6	41.3	44.5	40.2
7	40.2	35.1	33.2	32.9	28.5	34.2	63.9	45.6	36.1	41.3	43.4	39.1
8	40.2	35.6	33.7	91.0	27.5	30.2	62.3	43.4	35.6	40.2	43.4	39.1
9	39.1	36.1	34.2	30.2	27.2	29.8	62.3	44.5	35.6	40.2	43.4	38.0
10	28.0	36.6	34.2	29.1	27.5	29.8	59.6	44.5	36.6	40.2	43.4	38.0
11	37.5	37.0	33.7	31.3	26.9	29.1	58.3	42.4	39.1	40.2	43.4	39.1
12	37.0	36.6	32.4	33.7	25.7	28.2	58.3	41.3	38.0	40.2	43.4	40.2
13	36.6	36.6	32.4	32.1	24.5	27.8	56.9	40.2	36.6	46.7	43.4	40.2
14	36.6	36.6	33.2	30.5	23.6	27.8	54.3	40.2	36.1	59.6	43.4	38.0
15	36.6	37.0	32.8	32.1	22.7	27.8	52.9	40.2	37.0	47.8	43.4	39.1
16	35.1	36.1	32.1	32.1	23.3	27.5	51.6	39.1	37.0	45.6	41.3	39.1
17	35.6	36.6	31.7	31.7	23.9	27.5	51.6	38.0	35.6	44.5	41.3	40.2
18	35.6	35.6	31.7	32.1	23.3	27.5	51.6	37.5	35.1	43.4	40.2	40.2
19	37.0	34.6	31.7	30.9	20.3	26.2	56.9	38.0	35.1	42.4	41.3	40.2
20	36.6	34.6	31.7	28.8	20.6	26.3	54.3	39.1	35.1	42.4	42.4	40.2
21	35.6	35.6	30.5	28.2	21.2	25.7	65.5	40.2	35.1	41.3	43.4	40.2
22	34.6	35.6	30.5	26.9	22.7	25.1	58.3	40.2	35.1	42.4	43.4	40.2
23	34.6	36.6	30.9	26.9	509	35.9	55.6	41.3	35.6	42.4	43.4	40.2
24	34.6	36.6	31.3	26.6	154	250	54.3	43.4	36.6	43.4	42.4	40.2
25	34.6	36.1	31.3	25.7	62.3	3,880	62.3	44.5	50.2	41.3	41.3	40.2
26	35.1	36.6	30.5	25.4	47.8	4,160	58.3	44.5	45.6	40.2	40.2	40.2
27	35.1	37.0	29.8	25.4	42.4	1,100	54.3	43.4	41.3	40.2	40.2	41.3
28	35.6	37.0	29.1	24.8	38.0	152	52.9	41.3	39.1	40.2	40.2	40.2
29	35.6	28.8	24.5	36.1	92.0	51.6	39.1	40.2	40.2	40.2	40.2	40.2
30	35.6	28.8	24.2	34.6	90.1	51.6	39.1	41.3	41.3	40.2	40.2	43.4
31	35.6	28.8	24.2	33.2		51.6	38.0			52.9		
Sum	1,013.7	996.5	922.2	1,628.7	10,399.6	1,880.1	1,323.3	1,341.7	1,306.4	1,239.5		
	1,144.0											

Current Year 1959

Month	Extreme Gage			Extreme Second-Feet		Average Second- Feet	Total Acre-Feet	Period Dec. 1928-1959			
	Extremes		Day	High	Low			Acre-Feet			
	High	Low		Day	Day			Average	Maximum	Minimum	
Jan.	2.12	2.03	† 4	40.2	†22	34.6	36.9	2,270	426	2,270	
Feb.	2.09	2.03	†15	37.5	†19	34.6	36.2	2,010	579	5,760	
Mar.	2.06	1.86	1	36.1	30	28.2	32.1	1,980	519	2,500	
Apr.	3.14	1.73	8	338	†29	24.2	30.7	1,830	1,500	27,100	
May	5.40	1.56	23	2,300	19	19.2	52.5	3,230	3,022	29,400	
June	9.76	1.73	25	15,100	23	24.2	347	20,600	5,331	*	
July	2.85	2.21	20	200	19	50.2	60.6	3,730	2,204	30,000	
Aug.	2.22	2.08	† 1	51.6	18	37.0	42.7	2,620	2,004	48,700	
Sept.	2.25	2.03	25	55.6	†17	34.6	37.7	2,250	1,785	17,300	
Oct.	2.30	2.10	†13	62.3	3	38.0	43.3	2,660	1,126	8,940	
Nov.	2.23	2.11	† 1	52.9	†18	39.1	43.5	2,590	450	2,590	
Dec.	2.17	2.10	31	45.6	† 8	38.0	40.0	2,460	508	2,470	
Yearly	9.76	1.56		15,100		19.2	66.6	48,230	19,454	76,259.3	1,325.2

* Partly estimated † And other days

RIO SAN DIEGO AT JIMENEZ, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and masonry and concrete Cipoletti weir control for measuring flows up to 706 second-feet, located 4.4 miles west of Jiménez, Coahuila, and 5.0 miles above the confluence with the Rio Grande. This stream enters the Rio Grande 723.0 river miles below the American Dam at El Paso, Texas. The zero of the gage is 831.52 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on the weir discharge table, and a continuous record of gage heights. Records available: 1922 through December 1959. The records from 1922 to September 1932 are considered doubtful.

REMARKS: Reservoirs above and irrigation diversions above and below this station modify the flow of this spring-fed stream. On December 24, 1955, the zero of the gage was raised 2.62 feet to make it coincide with the crest of the weir.

EXTREME FLOWS FROM RECORDS †: Momentary: Max. about 75,200 second-feet on September 18, 1941, with a gage height of 20.96 feet. Min. no flow occurred on several occasions during April, May and June 1939; May and August 1952; and July and August 1953.

Average Flows in Second-Feet

Daily:	Max. * 23,200	Sept. 18, 1941	Min. 0	Occasionally
Monthly:	Max. 2,380	Oct. 1932	Min. 8.0	July 1956
Yearly:	Max. 527	1935	Min. 24.0	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	611	434	346	192	159	129	114	192	209	284	367	209
2	611	459	346	192	209	129	129	209	209	284	367	209
3	586	459	346	175	175	129	114	209	209	284	367	209
4	586	459	346	175	159	175	114	209	209	325	367	209
5	586	434	325	175	143	175	114	192	209	325	367	209
6	586	434	325	175	143	192	114	192	209	367	346	209
7	586	434	304	183	143	175	114	175	209	388	346	209
8	558	434	304	233	143	143	114	159	209	388	325	209
9	558	434	284	192	143	129	114	159	209	367	325	209
10	558	459	284	192	143	129	114	159	227	346	325	209
11	558	459	284	175	143	129	114	143	227	346	325	175
12	558	459	284	175	143	129	114	143	227	325	304	159
13	533	434	265	175	143	143	129	143	209	346	304	143
14	533	413	265	175	143	129	114	143	227	367	304	143
15	533	413	265	175	143	114	114	143	227	346	304	143
16	509	413	245	175	143	114	129	143	209	367	284	143
17	509	413	245	175	175	114	129	143	209	388	284	143
18	509	367	245	175	175	87.2	143	129	209	388	284	143
19	509	388	245	159	159	87.2	197	129	209	388	284	143
20	484	388	227	159	143	87.2	319	114	209	388	265	143
21	484	367	227	159	143	87.2	192	114	209	388	245	143
22	484	367	227	159	143	74.9	175	114	209	388	245	129
23	484	367	209	159	143	83.7	175	159	209	388	245	129
24	459	367	209	159	143	572	209	265	227	367	245	143
25	459	346	209	143	143	4,100	209	143	245	325	245	143
26	459	346	209	143	143	611	209	129	245	325	245	143
27	459	346	209	143	143	245	209	129	245	325	245	129
28	459	346	209	143	129	175	209	159	265	325	245	129
29	459	346	209	143	129	143	192	175	284	325	227	143
30	459	192	143	129	129	209	192	192	284	304	227	129
31	434	192	129	129	129	192	209	192	325	325	143	
Sum			11,439	5,080	8,859.4	5,016	10,792	5,071				
16,160			8,081	4,587	4,837.0	6,692	8,858					

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Period Oct. 1932-1959				
	High		Low	High				Acre-Feet				
	High	Low		Day	Day			Average	Maximum	Minimum		
Jan.	1.18	.95	† 1	611	31	434	521	32,050	7,326	36,430		
Feb.	.98	.82	† 1	459	17	346	409	22,700	5,730	25,760		
Mar.	.85	.56	† 2	367	29	192	261	16,030	5,321	27,040		
Apr.	1.15	.46	† 7	586	24	143	169	10,080	6,531	40,270		
May	.82	.43	2	346	28	129	148	9,110	* 14,612	120,200		
June	.76	.23	25	13,210	23	52.3	295	17,560	10,247	62,240		
July	1.48	.39	19	837	† 1	114	156	9,590	8,197	34,430		
Aug.	1.15	.36	24	586	23	100	162	9,950	7,088	738		
Sept.	.75	.56	† 29	304	† 1	192	223	13,280	15,095	* 84,620		
Oct.	.89	.69	† 7	388	2	265	348	21,410	18,808	146,640		
Nov.	.85	.62	† 1	367	† 29	227	295	17,580	12,446	68,290		
Dec.	.62	.43	1	227	† 19	129	164	10,070	8,459	45,320		
Yearly	7.61	.23		13,210		52.3	262	189,410	119,860	* 381,720		
										17,430		

* Partly estimated † And other days † Period 1932-1959

RIO SAN RODRIGO NEAR EL MORAL, COAHUILA

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and reinforced concrete control weir for measuring flows up to 177 second-feet. This station is located 10.6 miles west of the town of El Moral, Coahuila, 19.3 miles northwest from Piedras Negras, Coahuila and 11.2 river miles above the confluence with the Rio Grande. The stream enters the Rio Grande 736.2 river miles below the American Dam at El Paso, Texas. The zero of the gage is 879.95 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 5 meter measurements during the year, the weir discharge table, and a continuous record of gage heights. Records available: 1922 through December 1959. The records from 1922 to 1931 are considered doubtful.

REMARKS: The flow of this spring-fed stream is modified by irrigation diversions above and below this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. * 81,200 second-feet on September 7, 1932, with a gage height of 16.08 feet on the original gage (See Water Bulletin No. 16). Min. frequently no flow, which occurs at a gage height of 0.0 foot.

Average Flow in Second-Feet

Daily:	Max. * 27,900	Sept. 7, 1932	Min. 0	Frequently
Monthly:	Max. 4,270	Sept. 1932	Min. 0	Frequently
Yearly:	Max. 576	1932	Min. 3.2	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	265	217	184	123	96.1	87.6	64.3	57.2	230	96.1	87.6	71.7
2	265	217	184	123	105	87.6	57.2	57.2	194	96.1	87.6	71.7
3	265	217	184	123	105	87.6	57.2	57.2	162	96.1	79.5	64.3
4	265	217	184	123	105	87.6	57.2	57.2	132	152	79.5	64.3
5	265	207	173	123	105	87.6	57.2	57.2	113	123	71.7	57.2
6	265	207	173	123	96.1	132	57.2	57.2	96.1	113	71.7	57.2
7	265	207	173	123	105	50.1	57.2	57.2	87.6	105	71.7	57.2
8	252	207	173	142	87.6	96.1	50.1	50.1	79.5	105	71.7	57.2
9	252	207	173	123	96.1	87.6	50.1	50.1	79.5	96.1	79.5	57.2
10	252	207	162	123	87.6	87.6	50.1	50.1	87.6	96.1	87.6	57.2
11	252	194	162	123	87.6	87.6	43.8	50.1	87.6	96.1	87.6	57.2
12	252	194	162	123	87.6	79.5	43.8	50.1	79.5	96.1	87.6	57.2
13	252	194	162	123	87.6	71.7	50.1	43.8	71.7	96.1	79.5	57.2
14	252	194	152	123	87.6	71.7	50.1	43.8	71.7	96.1	79.5	57.2
15	240	194	142	123	87.6	71.7	43.8	64.3	71.7	96.1	79.5	57.2
16	240	184	142	123	87.6	71.7	43.8	57.2	71.7	96.1	79.5	57.2
17	240	184	142	113	96.1	71.7	43.8	50.1	71.7	96.1	79.5	50.1
18	240	184	142	113	87.6	64.3	43.8	43.8	71.7	96.1	71.7	43.8
19	230	184	142	105	87.6	57.2	71.7	43.8	71.7	87.6	71.7	37.4
20	230	184	142	105	105	57.2	230	43.8	71.7	87.6	79.5	37.4
21	230	184	105	142	57.2	123	43.8	57.2	71.7	87.6	71.7	37.4
22	230	194	142	105	155	57.2	96.1	43.8	71.7	87.6	71.7	31.4
23	230	184	142	105	132	57.2	87.6	50.1	71.7	96.1	71.7	31.4
24	230	184	142	105	105	71.7	79.5	87.6	132	96.1	71.7	31.4
25	230	184	132	105	123	71.7	71.7	57.2	123	96.1	71.7	31.4
26	230	184	123	105	105	96.1	64.3	313	113	87.6	71.7	37.4
27	217	184	123	105	105	79.5	64.3	565	105	87.6	71.7	37.4
28	217	184	123	105	105	71.7	64.3	456	96.1	87.6	71.7	37.4
29	217		123	105	96.1	64.3	64.3	367	87.6	87.6	71.7	37.4
30	217		123	105	87.6	64.3	64.3	302	113	87.6	71.7	43.8
31	217		123	105	87.6	64.3	64.3	252		87.6		
Sum		5,482	3,473	2,341.5	3,579.0	3,011.6	1,520.9					
		7,504	4,691	3,124.8	2,059.1	2,986.8	2,300.7					

Current Year 1959

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total	Period 1932-1959			
	High		Low	Day	Day			Acre-Feet	Average	Maximum	
	High	Low	Day	Day	High	Low	Acre-Feet	Average	Maximum	Minimum	
Jan.	1.08	.95	† 1	265	†27	217	242	14,880	3,294	14,880	0
Feb.	.95	.85	† 1	217	†16	184	10,860	2,615	11,580	0	
Mar.	.85	.66	† 1	184	†26	123	9,300	2,353	9,900	418	
Apr.	.75	.56	8	152	30	96.1	6,870	3,063	21,160	104	
May	1.70	.49	22	533	16	79.5	101	6,190	5,829	42,330	0
June	.79	.39	6	162	†19	57.2	78.0	4,640	5,405	41,660	0
July	1.12	.33	20	277	†11	43.8	66.4	4,080	3,251	12,170	0
Aug.	1.84	.33	† 26	593	†13	43.8	115	7,100	3,986	23,580	0
Sept.	1.02	.46	† 1	240	†13	71.7	99.6	5,920	22,984	* 253,960	0
Oct.	.79	.52	4	162	†19	87.6	97.1	5,970	11,385	99,910	0
Nov.	.52	.46	† 1	87.6	† 4	71.7	76.7	4,560	5,656	43,650	0
Dec.	.46	.26	† 1	71.7	†22	31.4	49.1	3,020	4,034	19,460	0
Yearly	1.84	.26		593		31.4	115	83,390	73,855	* 414,310	2,309

* Partly estimated † And other days ‡ Period 1932-1959

**RETURN FLOW TO THE RIO GRANDE AT MAVERICK POWER PLANT
NEAR EAGLE PASS, TEXAS**

DESCRIPTION: A part of the water diverted from the river into the Maverick Canal is returned to the Rio Grande through the hydroelectric power plant near Eagle Pass, Texas, at a point about 32.2 canal miles below the point of diversion, and about 746.7 river miles below the American Dam at El Paso, Texas.

RECORDS: Based on records furnished by the Maverick County Water Control and Improvement District No. 1, showing hourly manometer readings of discharge, in cubic feet per second, through each turbine at the Central Power and Light Company hydroelectric power plant. The mean daily discharges computed from the manometer readings have been multiplied by a factor to make them agree with periodic current meter measurements of flow made under stable flow conditions by hydrographers of this Commission. Records available: January 1949 through December 1959.

REMARKS: This power plant began operating April 16, 1932, with hydroelectric power generating facilities for 12,000 kw. Because the September 1932 flood washed out the upper end of the Maverick Canal, this plant did not operate from September 2, 1932 until March 17, 1937. Since then, however, it has operated continuously except for 44 days in 1953 when shortage of water prevented operation, and from June 30 to July 20, during flood of 1954, and while the canal was being repaired.

Average Flow in Second-Feet

Daily:	Max.	1,390		May 27, 1951	Min.	0	Frequently 1953 & 1954
Monthly:	Max.	1,160		June 1950	Min.	14.1	June 1953
Yearly:	Max.	1,020		1950	Min.	443	1953 & 1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,090	1,090	1,040	627	835	1,020	981	939	776	928	1,050	946
2	1,080	1,100	1,030	651	878	870	987	938	619	923	1,150	953
3	1,080	1,090	1,030	663	913	868	988	927	733	924	1,210	974
4	1,080	1,090	1,010	655	981	898	988	907	960	1,060	1,200	974
5	1,070	1,090	995	678	1,060	863	993	890	874	1,000	1,130	964
6	1,070	1,080	984	693	998	942	951	900	872	874	1,090	981
7	1,060	1,060	971	708	980	786	911	890	814	1,050	1,050	974
8	1,060	1,060	975	726	951	790	864	914	913	1,130	1,060	942
9	1,050	1,070	964	720	944	926	823	938	948	1,140	1,060	941
10	1,040	1,090	964	782	944	957	798	889	918	1,170	1,020	933
11	1,040	1,100	909	894	970	949	787	873	957	1,150	1,030	942
12	1,040	1,090	874	947	943	928	810	868	1,000	1,150	1,040	937
13	1,040	1,090	878	957	939	944	838	862	1,050	1,140	1,050	941
14	1,050	1,090	861	948	904	948	798	869	1,050	1,050	1,080	966
15	1,080	1,090	815	930	883	846	784	906	1,030	1,090	1,100	993
16	1,030	1,090	770	939	897	770	802	924	1,040	1,070	1,100	964
17	1,020	1,090	771	878	899	764	821	902	1,040	1,080	1,090	953
18	978	1,080	720	846	817	744	851	906	1,030	1,080	1,070	927
19	977	1,070	701	850	799	699	899	882	1,010	1,050	1,060	937
20	975	1,070	732	853	902	699	1,080	882	1,000	1,010	1,050	936
21	962	1,070	725	860	1,050	710	1,150	931	988	996	1,060	889
22	972	1,070	753	838	1,100	686	1,070	1,010	978	982	1,050	858
23	967	1,070	783	831	1,090	702	1,040	1,030	969	981	1,030	835
24	1,020	1,010	722	848	1,090	825	1,120	1,040	979	994	1,030	815
25	1,060	980	673	859	1,080	960	1,130	1,070	981	1,000	995	829
26	1,040	994	652	859	1,090	795	1,130	1,070	998	992	974	826
27	1,070	1,000	603	849	1,090	963	1,070	1,070	1,010	958	957	815
28	1,090	1,010	610	844	1,040	972	1,040	1,070	956	967	950	795
29	1,080		618	836	1,040	998	1,020	1,100	944	970	958	830
30	1,080		627	845	1,060	987	982	1,110	939	982	947	808
31	1,080		632		1,060	942	1,010		979			832

Sum	29,884	24,414	25,809
32,331	25,392	30,227	29,448

29,517	31,870	28,210
28,376	31,641	

Current Year 1959

Period 1949-1959

Month	Extreme Gage Feet			g Extreme Second-Feet		Average Second-Feet	Total	Acre-Feet			
	High	Low	Day	High	Low			Acre-Feet	Average	Maximum	Minimum
Jan.			† 1	1,090	21	962	1,040	64,100	50,500	65,500	34,400
Feb.			† 2	1,100	25	980	1,070	59,300	44,282	59,900	24,900
Mar.			1	1,040	27	603	819	50,400	43,018	65,400	18,900
Apr.			13	957	1	627	814	48,400	35,607	58,600	6,080
May			22	1,100	19	799	975	60,000	44,325	64,900	2,280
June			1	1,020	22	686	860	51,200	42,095	68,900	841
July			21	1,150	15	784	950	58,400	38,653	63,000	2,880
Aug.			30	1,110	13	862	952	58,500	46,345	68,900	22,600
Sept.			+13	1,050	2	619	946	56,300	49,927	67,500	18,500
Oct.			10	1,170	6	874	1,030	63,200	50,627	69,000	23,000
Nov.			3	1,210	30	947	1,050	62,800	48,509	65,800	27,300
Dec.			15	993	28	795	910	56,000	50,355	66,800	34,300
Yearly				1,210		603	951	688,600	544,243	740,000	320,701

† And other days g Mean daily

**RETURN FLOW TO THE RIO GRANDE FROM MAVERICK CANAL
MAVERICK DAM TO EAGLE PASS, TEXAS**

DESCRIPTION: Part of the water diverted from the Rio Grande into the Maverick Canal is returned to the river through various drains and spillways of the irrigation system located between Maverick Diversion Dam and Eagle Pass, Texas. These return flows are measured at gaging stations consisting of sharp-crested Cipolletti weirs or control structures equipped with continuous water-stage recorders located at Las Moras Creek, Lateral 2 Spill, Cañon Grande, Quemado Creek, Lateral 15 Spill, Hardt Spill, Houchin Spill, Elm Creek, and Seco Creek.

RECORDS: Based on the weir discharge table and a continuous record of gage heights. All storm flow occurring at these stations is deducted from the records and is not shown below. Records available: April 1, through December 31, 1959.

REMARKS: In addition to the flows listed below, water from the Maverick Canal is returned to the Rio Grande at the Maverick Power Plant (see preceding page).

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1				126	130	95.7	137	145	125	132	170	128
2				126	165	120	128	155	114	134	130	128
3				129	162	119	125	132	116	128	87.0	121
4				129	152	126	119	121	131	184	86.0	129
5				130	131	129	122	129	134	140	75.0	123
6				130	119	137	122	130	141	132	69.2	117
7				130	124	129	125	132	140	125	75.2	118
8				132	126	116	122	135	138	112	85.7	126
9				137	120	127	129	122	143	111	82.7	130
10				133	124	122	130	125	154	112	89.8	135
11				138	120	114	141	127	155	120	103	144
12				131	122	113	136	126	150	109	106	139
13				113	140	108	132	131	154	104	102	131
14				107	140	125	132	122	151	114	104	107
15				125	143	129	146	126	152	120	104	88.8
16				142	137	116	152	127	154	132	99.1	88.8
17				135	137	110	136	136	144	122	94.6	103
18				134	137	112	156	131	148	120	87.0	98.0
19				140	125	114	147	125	146	123	104	99.2
20				124	144	114	186	127	150	138	116	125
21				125	170	123	130	133	155	141	125	134
22				130	105	122	102	136	144	144	125	134
23				132	105	105	114	140	135	141	125	133
24				121	92.1	158	116	134	131	130	116	142
25				118	86.1	165	126	126	135	133	116	138
26				138	77.8	184	133	133	164	128	108	141
27				131	77.3	143	128	146	162	132	103	143
28				128	88.3	142	133	147	163	123	117	124
29				118	93.8	136	122	156	142	128	122	125
30				119	98.4	133	146	151	141	138	131	132
31					101		143	133		147		149
Sum				3,851	3,792.8	3,786.7	4,116	4,139	4,312	3,997	3,158.3	3,873.8

Current Year 1959										Period		
Month	Extreme Gage Feet		ϑ Extreme Second-Feet		Average Second-Feet	Total	Acre-Feet					
	High	Low	Day	Day			Day	Average	Maximum	Acre-Feet	Average	Maximum
Jan.												
Feb.												
Mar.												
Apr.												
May												
June												
July												
Aug.												
Sept.												
Oct.												
Nov.												
Dec.												
Yearly												

† And other days ϑ Mean daily

**RETURN FLOW TO THE RIO GRANDE FROM MAVERICK CANAL
EAGLE PASS TO SAN ANTONIO CROSSING**

DESCRIPTION: Part of the water diverted from the Rio Grande into the Maverick Canal is returned to the river through various drains and spillways of the irrigation system located between Eagle Pass, Texas and the San Antonio Crossing gaging station. These return flows are measured at gaging stations consisting of sharp-crested Cipolletti weirs or control structures equipped with continuous water stage recorders located at Lateral 40 Spill, Lateral 40 D Spill, Cañon Diablo, Lateral 50 Lowline No. 1, Lateral 50 Spill, Lateral 50 Lowline No. 2, Rosita Creek, Lateral 60 K Spill, Sauz Creek, Lateral 70 Spill No. 1, Lateral 70 Spill No. 2, Indio Creek, Gravel Spill, Lateral 71 Spill, and Cuervo Creek.

RECORDS: Based on the weir discharge table, stable station control rating tables, and a continuous record of gage heights. All storm flow occurring at these stations is deducted from the records and is not shown below. Records available: April 1, through December 31, 1959.

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1				155	139	130	142	152	152	130	164	137
2				158	126	150	173	145	143	165	165	125
3				153	194	122	140	156	138	143	124	124
4				158	179	235	126	152	133	219	91, 7	138
5				185	154	210	146	186	142	169	102	142
6				172	142	297	148	158	154	113	121	145
7				165	148	220	120	147	162	90, 2	134	141
8				219	138	163	121	141	169	88, 7	155	136
9				178	144	128	116	159	176	103	156	141
10				172	136	141	131	147	165	124	161	136
11				201	138	150	160	161	172	109	168	132
12				206	131	165	204	167	163	113	171	137
13				183	129	164	197	147	156	124	160	137
14				130	120	153	203	152	159	136	170	156
15				146	119	160	171	205	158	137	176	164
16				140	138	140	165	181	156	136	168	150
17				132	184	146	171	180	154	143	152	157
18				133	169	158	184	172	144	149	132	163
19				144	158	144	218	171	140	151	124	164
20				154	169	155	277	168	146	138	130	160
21				169	171	185	252	173	138	128	131	160
22				122	181	165	171	167	142	125	124	152
23				142	168	129	142	166	138	135	140	153
24				154	169	201	142	182	130	154	143	178
25				151	143	247	145	167	158	168	147	176
26				158	143	243	153	163	156	159	140	186
27				151	140	198	152	174	151	157	132	188
28				135	134	162	138	167	143	143	129	195
29				130	131	142	127	156	128	136	130	195
30				131	138	132	143	160	122	148	140	195
31				141		155	151			152		224
Sum				4,727		5,111		5,101		4,263.9		4,887
				4,730		5,010		4,490		4,280.7		

Current Year 1959

Month	Extreme Gage Feet			Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Period		
	High	Low	Day	High	Day	Day			Average	Maximum	Minimum
Jan.											
Feb.											
Mar.											
Apr.	8	219	22	122	158		9,380				
May	2	242	15	119	153		9,380				
June	6	297	3	122	170		10,100				
July	20	277	9	116	162		9,940				
Aug.	15	205	8	141	165		10,100				
Sept.	9	176	30	122	150		8,910				
Oct.	4	219	8	88,7	138		8,460				
Nov.	15	176	4	91,7	143		8,490				
Dec.	31	224	3	124	158		9,690				
Yearly											

g Mean daily

RIO GRANDE AT EAGLE PASS, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car and winch, located .5 mile above the international highway bridge between Eagle Pass, Texas, and Piedras Negras, Coahuila and 756.4 river miles below the American Dam at El Paso, Texas. The zero of the gage is 682.91 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 300 meter measurements during the year, 252 by the Mexican and 48 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 to March 1914; August 1914 to April 1916; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June 1922; September, November and December 1923; and January 1924 through December 1959.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was **964,100 second-feet, which occurred June 29, 1954, with a gage height of 53.51 feet. Well-authenticated information indicates the occurrence of a flood in June 1865 with an estimated discharge of 1,236,000 second-feet and a gage height of 56.00 feet on the present gage and also that these were the only floods since 1745 with flows greater than 825,000 second-feet. The lowest recorded flow was 24.4 second-feet, which occurred June 22, 1953 with a gage height of .07 foot.

Average Flow in Second-Feet ‡

Daily:	Max.	572,100	June 28, 1954	Min.	30,7	June 22, 1953
Monthly:	Max.	48,000	Sept. 1932	Min.	248	April 1953
Yearly:	Max.	9,180		Min.	870	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,470	2,980	2,560	1,690	1,690	2,430	2,860	2,240	8,580	4,730	2,750	2,060
2	3,470	2,980	2,490	1,650	3,480	2,080	3,000	2,240	7,490	14,270	3,080	2,120
3	3,470	2,980	2,370	1,650	2,930	2,120	3,710	2,200	5,610	11,800	2,750	2,060
4	3,470	2,830	2,370	1,610	2,370	2,320	3,880	2,040	6,780	12,360	2,860	2,120
5	3,420	2,830	2,280	1,610	3,350	2,120	3,670	2,000	10,140	25,460	2,700	2,120
6	3,420	2,760	2,240	1,650	3,410	3,340	4,060	2,000	9,850	24,760	2,500	2,010
7	3,470	2,700	2,200	1,690	2,630	7,700	3,960	1,960	8,090	6,710	2,410	2,010
8	3,600	2,700	2,160	2,160	2,370	4,270	3,570	2,000	6,640	4,630	2,450	1,970
9	3,470	2,700	2,240	2,000	2,160	3,020	3,190	2,000	5,440	4,100	2,450	2,060
10	3,350	2,700	2,240	1,800	2,080	2,660	3,050	1,920	4,630	3,710	2,410	2,120
11	3,310	2,700	2,160	1,880	2,240	2,680	3,960	1,840	4,270	3,530	2,410	2,120
12	3,310	2,660	2,120	2,040	2,280	2,900	3,670	1,800	5,300	3,350	2,450	1,970
13	3,250	2,660	2,080	2,000	2,120	2,160	3,330	1,760	3,880	3,290	2,360	1,940
14	3,250	2,660	2,080	1,960	2,200	2,280	2,770	1,760	3,850	9,780	2,360	1,970
15	3,210	2,630	2,080	1,920	2,200	2,080	2,460	1,760	3,240	5,860	2,450	2,010
16	3,160	2,590	1,960	1,960	2,040	1,720	2,250	1,840	2,760	3,920	2,450	2,120
17	3,120	2,590	1,960	1,840	4,030	1,650	2,160	1,800	2,590	3,470	2,410	2,120
18	3,120	2,560	1,960	1,800	4,270	1,570	2,390	1,760	2,530	3,350	2,360	1,970
19	3,120	2,560	1,920	1,840	4,240	1,500	3,140	1,690	2,370	3,060	2,310	1,940
20	3,160	2,590	1,880	1,800	3,150	1,430	8,020	1,650	2,370	2,940	2,410	1,940
21	3,120	2,590	1,920	1,760	3,210	1,400	16,670	2,120	2,240	2,880	2,410	1,940
22	3,070	2,590	1,960	1,760	2,930	1,370	11,970	3,960	2,200	2,770	2,450	1,910
23	3,020	2,590	1,880	1,800	2,760	1,300	7,240	3,370	2,200	2,710	2,450	1,940
24	3,020	2,530	1,840	1,760	3,050	3,850	5,540	4,200	2,320	2,610	2,450	1,970
25	3,120	2,490	1,880	1,760	2,590	18,050	4,450	4,870	2,370	2,610	2,310	1,940
26	3,120	2,430	1,880	1,720	2,430	15,220	3,710	5,160	2,830	2,560	2,270	1,940
27	3,120	2,530	1,840	1,760	2,370	9,640	3,190	6,140	2,830	2,420	2,180	1,940
28	3,120	2,530	1,760	1,800	2,200	3,780	2,860	5,650	2,490	2,420	2,100	1,940
29	3,020	1,760	1,760	2,160	3,140	2,730	5,610	2,280	2,420	2,100	2,060	
30	3,020	1,720	1,720	2,370	2,820	2,730	5,010	2,200	2,420	2,100	2,010	
31	2,930	1,720	2,490		2,490	2,550	6,250			2,460		2,010
Sum		74,640	54,150	83,800	112,600	90,600	183,360			62,350		
100,300		63,510		132,740		130,370			73,150			

Current Year 1959							Period 1924-1959		
Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet	
	High	Low	Day	High	Low			Average	Maximum
Jan.	3.28	2.82	8	3,670	31	2,930	3,240	199,100	153,078
Feb.	2.89	2.46	† 1	3,020	26	2,430	2,670	148,000	136,831
Mar.	2.56	1.84	1	2,560	† 30	1,650	2,050	125,900	127,156
Apr.	2.62	1.74	8	2,630	4	1,530	1,800	107,400	130,286
May	4.69	1.84	18	7,030	1	1,650	2,700	166,100	233,151
June	14.47	1.41	25	41,670	24	1,200	3,750	223,300	313,479
July	8.92	2.10	21	19,460	17	2,080	4,280	263,300	242,443
Aug.	5.31	1.77	31	8,090	† 19	1,570	2,920	179,700	* 1,255,000
Sept.	6.53	2.20	5	11,230	† 23	2,080	4,350	258,500	* 947,000
Oct.	14.50	2.13	6	45,200	1	1,980	5,910	363,600	485,463
Nov.	2.95	2.20	2	3,190	† 28	2,060	2,440	145,200	404,987
Dec.	2.33	2.03	16	2,240	† 21	1,860	2,010	123,700	154,554
Yearly	14.50	1.41		45,200		1,200	3,180	2,303,800	2,808,738
								6,946,510	631,520

* Partly estimated † And other days ‡ Period 1924-1959 ** Determined by slope-area calculations

RIO ESCONDIDO AT VILLA DE FUENTE, COAHUILA

DESCRIPTION: Water-stage recorder and reinforced concrete weir for measuring flows up to 45,9 second-feet located immediately below the highway bridge over Rio Escondido on the outskirts of Villa de Fuente, 3.1 miles southwest of Piedras Negras, Coahuila and 3.7 miles above the confluence with the Rio Grande. The cable and cable-car are located 1.2 miles upstream at the previous station site. This stream enters the Rio Grande 760.0 river miles below the American Dam at El Paso, Texas. The zero of the gage is 708.78 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 60 meter measurements during the year, the weir discharge table and a continuous record of gage heights. Computations by shifting channel methods for flows greater than 45,9 second-feet. Records available: 1922 through December 1959. Records from 1922 to September 1932 are considered doubtful.

REMARKS: Diversions and drainage returns modify the flow of this spring-fed stream at this station. Backwater from the Rio Grande reached an elevation of 729.92 feet during the flood of June 1954.

EXTREME FLOWS FROM RECORDS † : Momentary: Max. 24,000 second-feet on June 29, 1936 with a gage height of 19.13 feet. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max. 7,700	May 27, 1957	Min. 0	Several days 1956, 1957 & 1958
Monthly:	Max. 647	Oct. 1932	Min. 0.6	Aug. & Sept. 1957
Yearly:	Max. 115	1958	Min. 2.4	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	203	142	101	57.6	43.4	24.7	16.6	19.1	6.0	4.2	43.4	30.4
2	194	156	107	57.6	149	21.9	16.6	16.6	6.0	4.2	43.4	24.7
3	194	149	107	57.6	73.8	16.6	14.1	12.0	4.2	25.4	43.4	24.7
4	194	149	114	52.3	68.5	24.7	12.0	12.0	4.2	125	40.3	24.7
5	194	149	114	52.3	68.5	27.5	12.0	12.0	4.2	30.4	36.7	21.9
6	194	142	107	57.6	68.5	68.5	9.9	12.0	4.2	19.1	33.5	21.9
7	194	142	107	57.6	63.2	43.4	9.9	9.9	4.2	16.6	33.5	21.9
8	186	142	107	52.3	63.2	30.4	7.8	9.9	4.2	16.6	36.7	21.9
9	186	142	107	47.0	63.2	24.7	9.9	9.9	4.2	16.6	36.7	24.7
10	186	128	101	47.0	63.2	21.9	9.9	7.8	4.2	16.6	36.7	21.9
11	186	128	95.3	52.3	63.2	19.1	9.9	7.8	4.2	21.9	33.5	21.9
12	186	121	79.1	52.3	57.6	16.6	7.8	7.8	4.2	21.9	30.4	21.9
13	186	121	79.1	52.3	52.3	16.6	7.8	7.8	2.8	27.5	21.9	21.9
14	178	121	79.1	52.3	43.4	12.0	7.8	6.0	2.8	40.3	21.9	24.7
15	170	114	79.1	47.0	40.3	9.9	7.8	4.2	1.4	40.3	21.9	24.7
16	156	114	79.1	47.0	40.3	9.9	7.8	4.2	1.4	33.5	21.9	27.5
17	156	114	79.1	47.0	43.4	14.1	7.8	6.0	1.4	27.5	19.1	27.5
18	170	121	79.1	47.0	47.0	14.1	7.8	4.2	1.4	30.4	21.9	27.5
19	170	121	79.1	43.4	33.5	12.0	22.2	2.8	1.4	33.5	24.7	27.5
20	162	114	73.8	43.4	47.0	12.0	96.1	12.0	2.8	33.5	24.7	27.5
21	149	114	68.5	63.2	36.7	9.9	63.2	33.5	4.2	33.5	24.7	27.5
22	142	114	68.5	63.2	24.7	9.9	36.7	40.3	4.2	30.4	21.9	27.5
23	149	114	68.5	57.6	73.8	7.8	30.4	84.4	4.2	30.4	21.9	27.5
24	149	114	68.5	57.6	24.7	12.0	27.5	90.1	6.0	30.4	21.9	27.5
25	149	114	73.8	57.6	21.9	81	27.5	101	4.2	27.5	21.9	27.5
26	142	114	68.5	52.3	19.1	97.5	27.5	33.5	4.2	27.5	27.5	27.5
27	142	114	68.5	52.3	21.9	27.5	27.5	21.9	4.2	33.5	27.5	27.5
28	142	107	68.5	52.3	27.5	14.1	27.5	9.9	4.2	40.3	27.5	27.5
29	142	—	68.5	47.0	12.0	14.1	27.5	7.8	4.2	40.3	27.5	27.5
30	142	—	63.2	36.7	12.0	16.6	27.5	7.8	2.8	40.3	30.4	27.5
31	142	—	63.2	24.7	24.7	27.5	27.5	6.0	4.0	40.3	27.5	27.5
Sum	3,535	5,235	1,622.1	1,491.5	831.0	651.8	620.2	111.8	959.4	878.9	793.8	

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Period Oct. 1932-1959				
	High		Low	Day	High			Acre-Feet				
	High	Low		Day	Average			Average	Maximum	Minimum		
Jan.	1.44	1.15	1	203	31	135	169	10,380	2,240	15,990		
Feb.	1.25	1.02	† 2	156	28	107	126	7,030	1,516	9,990		
Mar.	1.05	.75	† 3	114	† 30	63.2	84.6	5,210	1,294	6,910		
Apr.	.85	.52	21	79.1	30	33.5	52.1	3,100	2,231	21,950		
May	2.10	.23	† 1	41.7	† 29	9.9	48.1	2,960	4,520	25,470		
June	3.25	.20	25	936	† 16	7.8	27.7	1,650	2,518	19,730		
July	2.62	.20	† 19	622	† 7	7.8	21.0	1,290	1,839	9,740		
Aug.	1.51	.03	25	19	19	.7	20.0	1,230	2,016	20,830		
Sept.	.20	.03	10	7.8	.7	.7	3.7	224	3,251	21,590		
Oct.	2.07	.10	4	403	1	2.8	30.9	1,900	3,446	39,790		
Nov.	.66	.36	1	47.0	† 16	19.1	29.3	1,740	2,643	25,730		
Dec.	.52	.39	1	33.5	† 5	21.9	25.6	1,580	2,310	20,720		
Yearly	3.25	.03		936		.7	52.9	38,294	29,824	83,164	1,755.3	

† And other days † Period October 1932-1959

**RIO GRANDE AT SAN ANTONIO CROSSING
NEAR VILLA GUERRERO, COAHUILA**

DESCRIPTION: Bubbler-type water-stage recorder, operated with bottled nitrogen gas, located on high ground about 1,000 feet from the river at San Antonio Crossing, .5 mile below Cuervo Creek which marks the lower end of the Maverick Irrigation District, 35.5 river miles below Eagle Pass, Texas, and Piedras Negras, Coahuila, 5 miles northeast of Villa Guerrero, Coahuila, and 792.4 river miles below the American Dam at El Paso, Texas. The zero of the gage is 581.61 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on a continuous record of gage heights. Computations for discharges up to 1,200 second-feet are based on a relatively stable rating curve defined by previous meter measurements. Computations for higher discharges are based on an extension of the curve. Records available: March, April, May, October, November and December 1952, with some days missing; January 1, through August 20, 1953; September 23, 1953 through June 14, 1954; and May 27, 1955 through December 1959, with some days missing.

REMARKS: The June 1954 flood reached an elevation of 624.31 feet at this station, with a discharge of 912,000 second-feet, determined by slope-area computations.

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	3,770	3,230	2,860	1,870	1,870	2,310	2,710	2,500	9,010	2,330	3,090	2,330	
2	3,750	3,300	2,800	2,910	2,340	3,160	2,470	8,060	12,100	3,430	2,350		
3	3,770	3,270	2,690	1,830	4,290	2,140	3,390	2,520	6,170	12,500	3,220	2,360	
4	3,720	3,210	2,640	1,790	2,730	2,440	4,190	2,340	6,250	14,500	3,050	2,410	
5	3,750	3,160	2,560	1,780	3,100	2,620	4,140	2,280	9,120	20,800	3,130	2,360	
6	3,750	3,120	2,550	1,820	3,950	2,840	3,800	2,280	11,100	* 31,500	2,750	2,380	
7	3,800	3,070	2,530	1,820	2,940	6,940	4,610	2,220	8,260	7,660	2,770	2,330	
8	3,830	3,050	2,460	2,020	2,710	5,540	3,770	2,160	6,770	5,380	2,740	2,350	
9	3,830	3,050	2,530	2,600	2,420	3,800	3,340	2,280	5,670	4,510	2,810	2,350	
10	3,750	3,030	2,530	2,050	2,310	3,120	3,050	2,240	5,040	4,040	2,750	2,410	
11	3,720	3,030	2,460	2,100	2,270	2,800	3,670	2,120	4,620	3,740	2,700	2,430	
12	3,720	3,030	2,360	2,310	2,440	3,210	4,110	2,060	4,820	3,450	2,740	2,400	
13	3,700	2,970	2,320	2,340	2,320	2,530	3,850	1,990	4,550	3,220	2,630	2,350	
14	3,670	2,970	2,340	2,180	2,260	2,410	3,160	1,980	4,250	7,060	2,680	2,330	
15	3,630	2,940	2,340	2,100	2,410	2,320	2,690	2,210	3,920	6,770	2,670	2,350	
16	3,530	2,920	2,240	2,140	2,270	1,950	2,420	2,050	3,350	4,290	2,680	2,500	
17	3,440	2,900	2,160	2,100	3,490	1,790	2,310	2,090	2,960	3,640	2,670	2,480	
18	3,410	2,880	2,140	2,020	3,560	1,710	2,270	2,010	2,830	3,590	2,600	2,450	
19	3,440	2,860	2,110	2,020	5,320	1,630	2,780	2,020	2,630	3,360	2,530	2,350	
20	3,460	2,880	2,080	2,040	3,670	1,520	7,940	1,840	2,560	3,130	2,580	2,350	
21	3,440	2,900	2,080	2,020	3,670	1,500	15,600	1,930	2,500	3,050	2,600	2,350	
22	3,370	2,880	2,160	1,950	3,230	1,500	13,500	3,940	2,500	2,940	2,700	2,300	
23	3,320	2,880	2,160	1,950	2,970	1,420	7,760	3,500	2,500	2,900	2,700	2,350	
24	3,340	2,840	2,010	2,020	3,230	1,800	6,610	4,840	2,500	2,830	2,650	2,410	
25	3,480	2,750	1,990	1,950	2,800	10,100	5,140	5,270	2,730	2,730	2,610	2,430	
26	3,480	2,690	2,040	1,950	2,650	22,900	4,300	5,220	2,970	2,790	2,500	2,480	
27	3,440	2,770	2,070	1,930	2,480	10,400	3,820	5,300	3,050	2,680	2,450	2,430	
28	3,440	2,800	1,960	1,920	2,390	5,170	3,280	5,640	2,940	2,650	2,410	2,460	
29	3,320	1,930	1,930	2,220	3,440	3,020	6,210	2,480	2,580	2,380	2,510		
30	3,250	1,980	1,900	2,490	2,990	2,880	5,700	2,390	2,560	2,350	2,600		
31	3,210	1,890	2,550					5,880		2,580		2,610	
Sum	83,380	60,290	117,180			97,090		187,880		74,550			
	110,530	70,970	89,920			139,960		138,500		81,570			
	Current Year 1959								Period # 1952-1959				
Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet			Average	Maximum	Minimum	
	High	Low	High	Low			Acre-Feet	Average	Maximum				Minimum
Jan.	3.16	2.86	9	3,900	31	3,180	3,570	219,000	97,338	219,000	53,730		
Feb.	2.91	2.61	2	3,300	26	2,670	2,980	165,000	85,028	165,000	43,270		
Mar.	2.72	2.12	1	2,880	28	1,870	2,290	141,000	74,571	141,000	38,100		
Apr.	2.72	2.04	9	2,880	4	1,760	2,010	120,000	*	150,328	* 433,000		
May	3.99	2.09	19	6,480	1	1,830	2,900	178,000	285,440	1,054,000	18,140		
June	8.74	1.65	26	36,600	23	1,340	3,910	232,000	171,927	335,000	8,260		
July	6.10	2.33	22	19,200	18	2,190	4,510	278,000	117,072	278,000	27,400		
Aug.	4.55	2.02	31	8,210	20	1,770	3,130	193,000	110,975	193,000	44,200		
Sept.	5.07	2.41	6	11,200	30	2,360	4,620	275,000	343,440	871,000	81,200		
Oct.	2.32	6	9*	31,500	1	2,220	6,060	373,000	*	460,703	* 1,741,000		
Nov.	3.15	2.48	2	3,590	†29	2,350	2,720	162,000	141,441	454,000	43,970		
Dec.	2.67	2.42	31	2,660	23	2,250	2,400	148,000	110,125	263,000	53,190		
Yearly		1.65				1,340	3,430	2,484,000	* 2,148,388	* 4,441,400	756,800		

* Partly estimated † And other days # Mean daily # Some months missing

RIO GRANDE AT PALAFOX, TEXAS

DESCRIPTION: Water stage recorder located on the outskirts of Palafox, Texas and Villa Hidalgo, Coahuila, 44.7 river miles upstream from the international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas and 845.2 river miles below the American Dam at El Paso, Texas. The zero of the gage is 436.02 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 18 meter measurements by boat during the year and a continuous record of gage heights. Computations by shifting channel methods. There are no facilities for measuring high flows at this station. Records available: August 5 to December 31, 1959.

REMARKS: This station was placed in operation August 5, 1959. Reservoirs, diversions and drainage returns modify the river flow at this station.

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1											2,900	2,430
2											3,300	2,430
3											3,380	2,380
4											3,090	2,380
5											3,050	2,430
6								2,300			2,910	2,380
7								2,300			2,780	2,380
8								2,250			2,740	2,340
9								2,220			2,740	2,340
10								2,300			2,830	2,340
11								2,220			2,740	2,430
12								2,090			2,740	2,380
13								2,060			2,780	2,300
14								2,060			2,740	2,220
15								2,010			2,740	2,300
16								2,170			2,740	2,300
17								2,060	3,000		2,780	2,430
18								2,060	2,870		2,690	2,380
19								2,010	2,690		2,650	2,340
20								1,980			2,610	2,300
21								1,840	2,690	3,440	2,690	2,250
22									2,560	3,000	2,690	2,300
23									2,470	2,960	2,780	2,220
24									2,470	3,000	2,740	2,250
25										2,960	2,740	2,300
26									2,780	2,910	2,650	2,300
27									3,050	2,870	2,560	2,300
28									3,000	2,740	2,520	2,250
29									2,740	2,740	2,470	2,250
30									2,560	2,690	2,470	2,300
31										2,690		2,380
Sum												72,310
												83,240

Month	Current Year 1959						Period			
	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High			Average	Maximum	Minimum	
Jan.										
Feb.										
Mar.										
Apr.										
May										
June										
July										
Aug.	4.69		29							
Sept.	6.14	2.69	7		25	2,380				
Oct.	17.55	2.69	6		1	2,380				
Nov.	3.51	2.72	2	3,530	† 29	2,430	2,770	165,100		
Dec.	2.76	2.53	† 2		2,470	2,170	2,330	143,400		
Yearly										

† And other days

RIO GRANDE AT LAREDO, TEXAS

DESCRIPTION: Bubbler-type water-stage recorder operated with bottled nitrogen gas, and cable with stand-up cable car located .9 mile downstream from the highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas, and 890.8 river miles below the American Dam at El Paso, Texas. The zero of the gage is 347.90 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 272 meter measurements during the year, 260 by the Mexican and 12 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: May 1900 through December 1913; May, June and October 1914; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June, November and December 1922; and January 1923 through December 1959. Gage-height records are available for January, February and March 1914.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. This station was established in January, 1955 to replace the station 1.5 miles upstream which was destroyed by the June-July 1954 flood.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was ** 716,900 second-feet, with a gage height of 61.35 feet, which occurred June 30, 1954. Much well-authenticated information establishes the occurrence of a greater flood in June 1865 with a gage height of 62.5 feet on the same gage and a discharge of approximately 950,000 second-feet and also that these were the only floods since 1745 with flows greater than 600,000 second-feet. The lowest recorded flow was zero which occurred various days in June and July, 1953 and on July 24, 1956.

Average Flow in Second-Feet ‡

Daily:	Max.	576,000		June 30, 1954	Min.	0	Several days	June, July 1953
Monthly:	Max.	49,500		Sept. 1932	Min.	5.5		June 1953
Yearly:	Max.	9,670		1932	Min.	1,080		1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,810	3,430	3,080	1,820	2,200	2,310	3,210	2,910	5,330	2,400	2,740	2,530
2	3,810	3,570	3,080	1,760	2,050	2,470	2,830	2,650	9,010	2,400	3,410	2,520
3	3,810	3,300	3,190	1,760	2,830	2,310	2,980	2,330	7,880	13,170	3,530	2,650
4	3,880	3,300	2,990	1,760	4,170	1,980	3,110	2,330	5,930	12,890	3,530	2,500
5	3,810	3,300	2,830	1,760	3,040	2,150	3,850	2,190	6,070	17,520	3,270	2,630
6	3,880	3,300	2,760	1,760	2,830	2,470	3,810	2,150	9,430	23,380	3,270	2,620
7	3,810	3,300	2,760	1,890	3,880	2,870	3,570	2,130	11,120	27,230	3,090	2,620
8	3,810	3,300	2,760	1,890	3,300	6,140	4,170	2,130	8,510	7,950	3,090	2,480
9	3,920	3,190	2,710	2,030	2,960	5,260	3,640	2,080	6,920	7,170	2,990	2,480
10	3,880	3,080	2,710	2,760	2,560	3,740	3,370	2,130	5,790	5,050	3,050	2,480
11	3,810	3,080	2,760	2,300	2,390	2,870	3,260	2,100	5,050	3,990	2,990	2,480
12	3,710	3,080	2,670	2,230	2,220	2,640	3,440	2,060	4,560	3,670	2,990	2,680
13	3,710	3,300	2,580	2,370	2,390	2,960	4,060	2,040	4,800	3,500	2,990	2,630
14	3,710	3,300	2,500	2,610	2,310	2,640	3,670	1,980	4,590	3,360	3,090	2,220
15	3,600	3,300	2,460	2,540	2,150	2,150	3,300	1,980	4,030	7,560	3,050	2,150
16	3,600	3,190	2,420	2,230	2,150	2,220	2,830	2,100	3,740	7,030	2,990	2,480
17	3,460	3,080	2,380	2,300	2,150	1,980	2,330	1,910	3,270	4,410	2,990	2,430
18	3,370	3,080	2,340	2,300	2,810	1,700	2,190	1,960	3,040	3,740	2,990	2,550
19	3,320	2,990	2,300	2,300	3,710	1,620	2,220	1,910	2,950	3,600	2,810	2,750
20	3,320	2,900	2,260	2,300	4,660	1,560	3,260	1,910	2,740	3,450	2,810	2,590
21	3,370	2,990	2,260	2,300	3,920	1,480	7,950	1,840	2,610	3,320	2,810	2,430
22	3,370	2,990	2,260	2,300	3,600	1,410	16,210	1,790	2,540	3,220	2,990	2,310
23	3,320	2,990	2,260	2,300	3,230	1,350	13,100	3,320	2,400	3,130	2,990	2,200
24	3,320	2,990	2,300	2,200	2,940	1,300	7,700	3,810	2,400	3,130	3,090	2,390
25	3,320	2,990	2,170	2,200	3,450	1,360	5,900	4,240	2,400	3,090	2,990	2,270
26	3,320	2,990	2,080	2,200	3,160	14,130	4,730	4,910	3,600	2,930	2,940	2,350
27	3,370	2,900	2,000	2,340	2,720	19,320	4,100	4,980	3,040	3,040	2,810	2,500
28	3,320	2,990	2,000	2,270	2,470	9,920	3,640	4,980	3,080	2,830	2,680	2,440
29	3,320	2,000	2,340	2,310	5,260	3,260	5,330	3,080	2,740	2,540	2,250	
30	3,250	1,820	2,270	2,150	3,670	3,060	5,900	2,610	2,650	2,410	2,260	
31	3,180	1,740		2,150		2,910	5,330		2,560		2,530	
Sum	88,200	65,390	88,860	113,240	89,410	196,110	76,400					
	110,490	76,430	137,660	142,520	89,920							

Current Year 1959 Period 1924-1959

Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	Day			Average	Maximum	Minimum
Jan.	2.95	2.62	† 4	3,920	31	3,560	219,200	157,927	351,700
Feb.	2.76	2.46	2	3,810	28	2,830	3,150	174,800	41,050
Mar.	2.59	1.84	† 2	3,190	† 30	1,740	2,470	151,600	129,606
Apr.	2.33	1.80	10	2,780	† 3	1,680	2,180	129,700	140,177
May	3.58	1.84	20	5,610	30	1,980	2,870	176,200	270,052
June	13.32	1.31	27	31,180	25	1,240	3,770	224,600	319,432
July	9.06	1.74	22	18,010	18	2,150	4,440	273,000	1,994,000
Aug.	4.04	1.48	30	6,220	22	1,620	2,880	177,300	357,337
Sept.	6.59	1.84	7	11,580	25	2,300	4,750	282,700	506,082
Oct.	14.27	1.84	3	36,730	2	2,300	6,330	389,000	437,517
Nov.	2.72	1.84	19	3,880	30	2,270	3,000	178,300	1,951,000
Dec.	2.17	1.87	19	2,750	15	2,150	2,460	151,500	161,735
Yearly	14.27	1.31		36,730		1,240	3,490	2,527,900	2,974,942
								7,017,110	786,640

† And other days Ø Mean daily ** Determined by slope-area calculations † Period 1924-1959

RIO SALADO AT LAS TORTILLAS, TAMAULIPAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car, and control wall with notch opening of 2,500 second-one-feet capacity located 6.2 miles southeast of the town of Las Tortillas, Tamaulipas, 2 miles below the confluence of the Río Sabinas with the Río Salado and 24.8 miles above the confluence of the Río Salado with the Río Grande. This confluence is 949.8 river miles below the American Dam at El Paso, Texas. The zero of the gage is 325.72 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 54 meter measurements during the year, a stable rating curve up to 2,500 second-feet and a continuous record of gage heights. Computations by shifting channel methods for flows greater than 2,500 second-feet. Records available: September 9, 1953 through December 1959. Records are also available for a station at Cd. Guerrero, 18.6 miles downstream, from 1900 through 1913 and 1923 through September 8, 1953.

REMARKS: Reservoirs and irrigation diversions modify the flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 27,720 second-feet on October 16, 1958 with a gage height of 23.79. Min. frequently no flow. Extreme flow data for the Río Salado at Cd. Guerrero prior to 1954 may be found in previous bulletins.

Average Flow in Second-Feet †

Daily:	Max. 25,600	Oct. 18, 1958	Min. 0	Frequently
Monthly:	Max. 8,500	Oct. 1958	Min. 0	Frequently
Yearly:	Max. 2,020	1958	Min. 56.8	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	720	971	558	206	166	113	85.5	254	103	69.6	69.6	55.1
2	667	2,760	586	206	191	103	77.0	191	103	77.0	69.6	55.1
3	749	3,740	1,060	191	222	103	77.0	144	93.9	85.5	69.6	55.1
4	2,920	3,780	1,980	191	222	77.0	69.6	123	85.5	69.6	85.5	48.4
5	3,020	2,630	1,980	178	191	85.5	69.6	123	85.5	77.0	85.5	48.4
6	893	777	1,380	191	191	103	77.0	103	77.0	69.6	85.5	42.4
7	692	667	558	191	178	123	77.0	103	77.0	69.6	77.0	42.4
8	639	558	473	191	178	178	77.0	103	69.6	69.6	77.0	42.4
9	1,580	494	431	191	178	178	69.6	103	69.6	69.6	77.0	48.4
10	3,490	452	388	191	166	123	77.0	103	93.9	69.6	77.0	42.4
11	2,400	431	367	206	166	103	77.0	103	85.5	62.2	69.6	31.4
12	749	452	348	222	155	93.9	85.5	93.9	93.9	77.0	69.6	31.4
13	639	473	316	222	155	85.5	388	85.5	85.5	123	69.6	31.4
14	611	473	301	206	144	93.9	144	113	123	103	77.0	31.4
15	537	893	285	191	113	103	85.5	103	123	85.5	77.0	31.4
16	516	2,140	301	191	113	103	85.5	85.5	85.5	85.5	77.0	42.4
17	494	2,140	285	191	144	123	77.0	133	69.6	85.5	77.0	42.4
18	516	2,080	285	191	155	255	77.0	133	55.1	85.5	77.0	31.4
19	516	2,080	254	191	155	166	164	103	55.1	85.5	69.6	31.4
20	537	1,540	254	191	155	113	466	85.5	55.1	85.5	69.6	26.5
21	537	639	254	191	144	103	872	77.0	55.1	85.5	69.6	21.5
22	537	494	254	178	123	113	1,350	77.0	55.1	77.0	69.6	21.5
23	537	473	254	155	113	103	410	113	48.4	77.0	69.6	31.4
24	516	473	222	155	123	93.9	238	600	48.4	77.0	69.6	36.4
25	516	494	222	166	222	85.5	280	1,310	55.1	77.0	69.6	36.4
26	516	516	222	155	191	155	144	1,310	55.1	77.0	62.2	36.4
27	516	537	222	155	238	93.9	238	452	62.2	113	55.1	36.4
28	537	558	238	166	191	123	191	269	77.0	85.5	55.1	42.4
29	537	238	191	133	133	155	191	69.6	85.5	55.1	36.4	36.4
30	558	238	166	123	113	123	254	144	85.5	69.6	48.4	31.4
31	586	222		113			178	123		69.6		42.4
Sum	33,715	5,607	5,052	3,542.1			7,054.4		2,498.6		1,183.8	
	28,778	14,976		6,715.8				2,300.8		2,130.2		

Month	Current Year 1959			Period Oct. 1953-1959					
	Extreme Gage Feet		High	Low	Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low					High	Low	Minimum
Jan.	4.00	1.54	5	3,740	17	494	928	57,070	0
Feb.	4.04	1.44	† 3	3,780	†10	431	1,200	66,880	0
Mar.	2.95	1.02	† 4	1,980	31	206	483	29,690	0
Apr.	1.08	.85	†12	238	26	144	187	11,120	5,565
May	1.21	.75	27	301	†15	113	163	10,020	19,300
June	1.48	.59	18	452	4	69.6	118	7,030	8,228
July	2.69	.56	22	1,620	9	62.2	217	13,310	5,373
Aug.	2.79	.62	25	1,760	†21	77.0	228	13,980	18,650
Sept.	.95	.46	10	178	†19	42.4	76.7	4,560	0
Oct.	.82	.56	†13	133	† 1	62.2	80.6	4,950	81,657
Nov.	.66	.49	† 4	85.5	30	48.4	71.0	4,220	49,823
Dec.	.52	.30	† 1	55.1	†21	16.6	38.2	2,350	25,540
Yearly	4.04	.30		3,780		16.6	311	225,180	324,551
								1,463,797	41,238.2

† And other days † Period September 1953-1959

RIO GRANDE BELOW FALCON DAM

DESCRIPTION: The discharges reported below represent water measured as it leaves Falcón Reservoir through turbine penstocks, by-pass valves, spillway gates, and leakage. Falcón Dam, astride the Rio Grande, is located 84.5 river miles downstream from Laredo, Texas and Nuevo Laredo, Tamaulipas; 974.4 river miles below the American Dam at El Paso, Texas; and 273.8 river miles above the Gulf of Mexico. A water-stage recorder and a cable with stand-up cable car located 2.5 and 3.5 river miles downstream, respectively, are used to measure the flow of this station at those times when spillway gates are in operation.

RECORDS: Based on daily Simplex meter records of releases through the six turbines, established rating curves for the four hollow-jet by-pass valves, estimates of gate leakage, measurements of flow at the cable during spillgate operations, and 7 current meter measurements during the year, 4 by the United States and 3 by the Mexican Section of this Commission. Records available: January 1, 1958 through December 31, 1959. Records are also available from December 17, 1952 through December 31, 1957 for a station at Chapeno, 2.5 miles downstream, where discharges included arroyo inflow below Falcón Dam, which inflow is eliminated from the records reported below.

REMARKS: Computation of flow was made jointly by the United States and Mexican Section of the Commission from a consolidation of the basic data gathered by each section incident to the international operation of Falcón Reservoir.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 48,900 second-feet on November 9, 1958. Min. no flow occurs at times.

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	702	6,070	6,080	4,050	2,770	5,270	3,780	537	4,900	3,920	272	813
2	696	5,980	6,060	4,040	3,100	5,800	3,980	1,130	5,010	4,030	36.0	826
3	716	6,040	6,000	4,050	3,220	6,700	2,390	1,140	4,970	3,530	36.0	1,160
4	696	5,980	6,030	4,060	3,190	6,370	3,660	1,170	4,970	3,730	347	1,330
5	708	5,990	6,120	4,060	3,180	7,730	4,920	1,580	4,580	2,810	1,040	1,020
6	722	6,000	6,110	4,050	3,420	5,620	4,530	1,820	5,360	1,130	36.0	1,460
7	710	6,000	6,120	3,770	3,360	5,180	4,870	1,300	5,700	1,850	440	1,220
8	704	5,980	6,130	3,160	5,190	4,900	5,080	1,380	5,660	1,270	1,230	539
9	706	6,030	6,050	2,900	5,710	5,710	6,460	1,340	5,650	2,110	1,640	1,180
10	698	5,970	6,060	2,850	5,820	6,510	6,080	1,030	4,960	2,070	1,600	1,800
11	680	6,030	6,020	2,870	5,880	8,050	5,920	885	4,840	1,640	815	2,020
12	688	6,030	6,020	2,870	5,040	8,430	5,890	1,600	3,490	1,220	821	1,030
13	1,390	6,020	6,000	2,840	5,530	7,280	5,020	1,900	3,760	1,400	834	820
14	3,640	6,040	6,000	2,890	6,800	6,760	4,960	1,910	4,400	812	383	1,320
15	4,600	6,020	6,030	2,880	7,320	4,630	3,750	1,630	4,370	726	36.0	1,560
16	5,000	6,020	6,030	2,820	7,960	1,950	4,260	2,020	4,380	1,650	335	964
17	5,020	6,050	5,980	2,800	8,950	1,410	4,070	2,330	4,720	1,290	335	1,080
18	4,960	6,030	6,030	2,810	8,780	1,030	3,660	2,500	4,190	1,900	337	2,720
19	5,010	6,030	6,020	2,800	8,500	1,700	3,050	2,030	3,800	2,000	334	2,800
20	4,940	6,030	6,040	2,810	6,930	2,570	2,440	2,500	4,280	1,840	432	2,470
21	5,010	6,050	6,010	2,740	7,150	2,630	2,980	2,810	4,580	915	909	2,390
22	5,380	6,020	6,090	2,760	6,660	2,790	2,900	3,230	4,400	930	912	2,560
23	6,060	6,040	6,060	2,810	6,310	2,390	3,680	3,180	4,840	923	994	3,250
24	6,000	6,070	6,100	2,810	5,240	2,090	2,170	2,020	5,110	920	638	3,650
25	5,950	6,070	5,560	2,750	4,330	754	2,450	787	4,300	904	1,220	3,800
26	5,970	6,070	4,010	2,790	4,180	754	2,090	753	3,710	1,630	1,450	3,610
27	5,990	6,090	4,020	2,710	4,310	827	2,520	1,180	3,990	584	1,410	3,470
28	6,000	6,060	4,050	2,840	3,010	3,770	2,950	2,770	4,380	329	1,030	3,880
29	5,980	4,040	2,850	2,520	3,370	2,610	3,690	4,180	323	741	3,900	3,900
30	6,030	4,020	2,770	4,420	4,400	1,520	3,920	4,460	322	722	4,110	4,110
31	6,060	4,090			5,190	778	4,260		329			4,170
Sum	168,810		93,210		127,375		60,332		49,037		66,922	
	107,416		174,980		163,970		115,418		137,940		21,365	

Current Year 1959

Month	Extreme Gage Feet			@ Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low			Average	Maximum	Minimum
Jan.			†23	6,060	11	680	3,460	213,000	222,683	368,000
Feb.			27	6,090	10	5,970	6,030	335,000	214,200	349,000
Mar.			8	6,130	26	4,010	5,640	347,000	163,165	347,000
Apr.			† 4	4,060	27	2,710	3,110	185,000	172,422	347,000
May			17	8,950	29	2,520	5,290	325,000	311,133	526,000
June			12	8,430	† 25	754	4,250	253,000	314,233	437,000
July			9	6,460	31	778	3,720	229,000	102,362	229,000
Aug.			31	4,260	1	537	1,950	120,000	137,800	206,000
Sept.			7	5,700	12	3,490	4,600	274,000	144,957	274,000
Oct.			2	4,030	30	322	1,580	97,300	358,405	1,997,000
Nov.			9	1,640	† 2	36.0	712	42,400	217,987	1,128,000
Dec.			31	4,170	8	539	2,160	133,000	182,643	465,000
Yearly				8,950		36.0	3,530	2,553,700	2,541,990	5,016,800
										1,482,330

† And other days @ Mean daily # Values prior to 1958 are Chapeno discharges less arroyo inflow.

RIO ALAMO AT CD. MIER, TAMAULIPAS

DESCRIPTION: Water-stage recorder and cable with sit-down cable car and reinforced concrete weir for measuring flows up to 177 second-feet, located 3.1 miles above the confluence of the Rio Alamo with the Rio Grande and .6 mile west of Cd. Mier, Tamaulipas, at a point called "El Paso del Cántaro." This stream enters the Rio Grande 986.8 river miles below the American Dam at El Paso, Texas. The zero of the gage is 188.35 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 6 meter measurements made at high flows during the year, the weir discharge table at low flows, and a continuous record of gage heights. High-flow computations by shifting channel methods. Records available: July 1, 1923 through December 1959.

REMARKS: Small reservoirs and irrigation diversions modify the flow of this spring-fed stream at this station. On June 11, 1952 the recorder was moved 515 feet downstream to a point 312 feet above the weir, and the zero of the gage changed to coincide with the weir crest elevation.

EXTREME FLOWS FROM RECORDS: Momentary: Max. * 144,800 second-feet on September 11, 1948, with a gage height of 33.56 feet. Periods of no flow occurred at times during all years of record except 1934 and 1935.

Average Flow in Second-Feet †

Daily:	Max.	87,230	Sept. 11, 1948	Min.	0	Frequently
Monthly:	Max.	5,170	Sept. 1948	Min.	0	Frequently
Yearly:	Max.	536	1953	Min.	16.4	1929

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	80.5	27.9	54.7	18.7	8.1	0	0	4.2	21.2	75.2	1,400	15.9
2	71.7	27.9	54.7	15.9	8.1	0	0	5.3	15.9	20.8	696	15.9
3	62.9	30.0	54.7	13.1	8.1	0	0	2.5	13.1	9.5	138	15.9
4	59.0	48.4	54.7	8.1	12.0	0	0	2.1	12.4	6.0	36.0	17.3
5	56.9	47.3	54.7	8.1	10.6	6.7	0	2.5	9.2	4.2	27.9	17.3
6	54.7	47.3	47.3	8.1	8.1	7.8	0	1.8	7.1	4.2	17.7	15.9
7	59.0	47.3	47.3	6.0	8.1	0	0	1.1	7.1	3.5	13.8	14.5
8	65.0	46.3	47.3	6.0	10.6	0	0	.7	43.1	1.1	11.3	13.1
9	63.2	40.6	47.3	6.0	8.1	0	0	76.3	11.3	.7	9.5	14.5
10	61.1	37.4	43.8	6.0	7.1	0	0	13.8	86.2	.4	9.2	15.9
11	56.9	35.3	43.8	8.1	6.0	0	0	91.1	63.9	0	10.6	15.9
12	54.7	35.3	40.6	10.6	4.2	0	0	180	44.8	0	10.6	14.5
13	50.9	30.7	37.1	10.6	4.2	0	0	28.6	30.7	162	10.6	10.6
14	45.6	27.9	37.1	10.6	2.5	0	0	66.0	34.6	1,350	10.6	10.6
15	42.0	30.7	33.9	10.6	2.5	0	0	82.3	25.1	129	10.6	10.6
16	38.8	35.3	33.9	10.6	1.1	0	0	22.6	17.3	30.0	15.9	10.6
17	37.1	50.5	33.9	10.6	1.1	0	0	13.1	14.5	13.8	15.9	10.6
18	35.3	48.4	27.9	10.6	.7	0	0	6.0	11.7	6.7	18.7	10.6
19	33.9	45.6	33.9	10.6	0	0	0	3.9	10.6	4.2	17.3	10.6
20	30.7	47.3	33.9	10.6	0	0	0	2.8	9.5	3.9	18.7	10.6
21	27.9	42.4	27.9	10.6	0	0	0	1.8	7.1	2.5	17.3	10.6
22	27.9	44.1	27.9	10.6	0	0	0	1.1	6.0	2.1	17.3	10.6
23	27.9	59.0	27.9	10.6	0	0	0	25.4	50.5	4.2	1.1	15.9
24	27.9	63.2	27.9	10.6	0	0	0	8.8	4,700	2.5	1.1	15.9
25	27.9	57.2	21.5	10.6	0	0	0	4.6	1,780	2.5	1.1	14.5
26	27.9	50.9	21.5	13.1	0	0	0	2.8	276	.7	14.5	10.6
27	26.5	56.9	18.7	10.6	0	0	0	1.4	137	12.0	0	13.1
28	24.7	56.9	18.7	13.1	0	0	0	1.1	54.7	6.0	0	15.9
29	24.7	18.7	10.6	0	0	0	0	5.3	37.1	26.5	0	10.6
30	24.7	21.5	9.2	0	0	0	0	7.1	27.5	445	.7	15.9
31	26.5	24.7	0	0	0	0	0	6.4	24.4	6.0	0	10.6
Sum	1,218.0	309.1	14.9		7,696.8	1,840.5					388.0	
	1,354.4	1,119.4	111.2	62.9		1,027.9					2,655.1	

Month	Extreme Gage Feet			Current Year 1959		Period 1924-1959		
	Extreme Second-Foot		Average Second-Feet	Total Acre-Feet		Acre-Feet		
	High	Low	Day	Day	Day	Average	Maximum	Minimum
Jan.	.79	.36	1	84.8	127	24.7	43.7	2,690
Feb.	.66	.39	123	63.2	1	27.9	43.5	2,420
Mar.	.59	.30	1	54.7	127	18.7	36.1	2,220
Apr.	.33	.13	1	21.5	1	6.0	10.3	613
May	.20	0	4	12.0	119	0	3.6	221
June	.72	0	5	71.3	1	0	.5	29.2
July	.69	0	23	67.1	1	0	2.0	125
Aug.	6.96	0	24	8,400	18	0	248	15,270
Sept.	2.82	.07	30	1,150	123	2.5	34.3	2,040
Oct.	5.09	0	14	4,450	111	0	59.4	3,650
Nov.	6.33	.13	1	6,960	1	1.4	88.5	5,260
Dec.	.26	.20	4	17.3	113	10.6	12.5	5,769
Yearly	6.96	0		8,400	0	48.8	35,307.2	131,764
							387,800	11,898.7

* Partly estimated † And other days ‡ Period 1924-1959

CONTRIBUTIONS FROM RIO SAN JUAN

DESCRIPTION: The discharges reported below comprise the total flow entering the Rio Grande through the Rfo San Juan Channel and the various drains serving the Rfo San Juan irrigation system between Roma and Anzaldas Dam site. The confluence of the Rfo San Juan and the Rio Grande is 1,010.4 river miles below the American Dam at El Paso, Texas, 3.9 river miles above Fort Ringgold gaging station, and 9.4 river miles below Marte Gómez Dam on the Rfo San Juan.

RECORDS: The portion of water reaching the Rio Grande above Fort Ringgold gaging station through the Rfo San Juan Channel was measured at a station consisting of water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located opposite Camargo, Tamaulipas, about 3.1 river miles above the confluence with the Rio Grande. The balance consisted of discharges through the Rancherfas and Los Fresnos drains which were determined by prorating between weekly current meter measurements. The water reaching the Rio Grande below Fort Ringgold gaging station via Puericitos, Los Indios, Huizache, and Morillo drains was determined by prorating between weekly current meter measurements. All storm water measured at the above mentioned drains was deducted and is not shown here. No water was released from Marte Gómez Reservoir for use in the United States during 1959. Records available: January 1953 through December 1959.

REMARKS: Only 82.7 acre-feet of water returned to the Rio Grande through Los Fresnos Drain during a few days in 1959. Mean daily discharges of the various other contributions are found in the following two pages including separate mean daily discharges of Morillo Drain for correlation with electrical conductivity of water samples, taken at this station, which appear on page 79 of this bulletin.

Above Fort Ringgold Station

Month	Extreme Gage Feet			Current Year 1959		Average Second-Feet	Total Acre-Feet	Period 1953-1959				
	Extreme Gage Feet		Day	Current Year 1959				Acre Feet				
	High	Low		High	Low			Average	Maximum	Minimum		
Jan.			1	1,230	31	485	836	51,360	8,151	51,360 *	182	
Feb.			† 7	518	† 12	414	472	26,250	4,230	26,250 *	182	
Mar.			† 3	581	31	88.9	332	20,360	3,399	20,360	182	
Apr.			11	90.5	30	33.3	63.0	3,750	2,597	8,480	131	
May			1	28.0	31	7.9	16.8	1,030	2,967	8,510	111	
June			6	40.9	2	6.2	17.0	1,010	2,746	9,110	78.6	
July			1	11.7	13	5.9	7.9	483	1,119	1,930	43.8	
Aug			3	10.8	28	4.9	7.0	432	10,959	66,040	260	
Sept.			† 29	6.4	11	4.0	5.0	298	46,697	294,800	298	
Oct.			† 21	12.3	† 9	5.7	9.2	570	163,712	901,800	252	
Nov.			8	9.6	27	5.5	8.4	505	38,952	230,400	405	
Dec.			10	11.0	1	6.8	8.9	547	10,890	68,580	317	
Yearly				1,230		4.0	147	106,595	296,419	1,231,907	18,151	

Below Fort Ringgold Station

Month	Extreme Gage Feet			Current Year 1959		Average Second-Feet	Total Acre-Feet	Period 1953-1959				
	Extreme Gage Feet		Day	Current Year 1959				Acre-Feet				
	High	Low		High	Low			Average	Maximum	Minimum		
Jan.			† 1	49.7	28	40.8	44.6	2,740	1,749	2,740	661	
Feb.			27	51.7	† 1	41.5	44.3	2,460	2,535	4,010	1,230	
Mar.			1	50.0	23	27.5	39.7	2,440	1,941	2,440	1,050	
Apr.			† 28	104	1	44.0	77.9	4,630	2,733	4,630	1,350	
May			27	155	† 1	104	118	7,240	4,296	7,240	1,900	
June			10	107	25	82.9	94.7	5,640	4,485	6,440	1,460	
July			2	88.5	† 30	40.0	66.8	4,110	2,940	4,110	1,380	
Aug			19	64.2	† 4	39.8	54.8	3,370	1,800	3,370	535	
Sept.			7	67.6	18	39.0	52.5	3,130	1,838	3,130	1,110	
Oct.			5	97.0	31	38.8	64.7	3,980	1,917	3,980	1,160	
Nov.			1	38.2	27	32.1	34.8	2,070	1,456	2,730	845	
Dec.			10	34.1	† 29	25.1	30.8	1,890	1,572	3,110	753	
Yearly				155		25.1	60.4	43,700	29,262	43,700	20,051	

* Partly estimated † And other days Ø Mean daily

CONTRIBUTIONS FROM RIO SAN JUAN – Above Fort Ringgold Station
Mean Daily Discharge in Second-Feet

RANCHERIAS DRAIN

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.7	1.1	1.5	1.3	5.0	5.5	5.0	2.6	1.3	1.2	.7	.8
2	2.7	1.2	1.5	1.3	5.8	5.1	4.6	2.8	1.4	1.2	.7	.7
3	2.7	1.3	1.6	1.3	6.1	8.4	4.2	3.0	1.6	1.2	.6	.7
4	2.5	1.4	1.6	1.3	6.3	11.7	3.8	2.8	1.5	1.1	.7	.8
5	2.3	1.6	1.6	1.3	6.6	15.0	3.5	2.6	1.5	1.1	.7	.8
6	2.1	1.7	1.6	1.3	6.9	18.3	3.1	2.3	1.4	1.1	.7	.8
7	1.9	1.8	1.6	1.3	7.1	15.4	2.7	2.1	1.4	1.1	.7	.8
8	1.7	1.7	1.6	1.3	7.4	12.5	2.6	1.9	1.4	1.1	.8	.8
9	1.6	1.6	1.7	1.2	7.7	9.7	2.6	1.7	1.3	1.1	.8	.8
10	1.3	1.6	1.7	1.2	7.6	6.8	2.5	1.4	1.3	1.1	.8	.8
11	1.4	1.5	1.7	1.2	7.6	6.3	2.5	1.2	1.2	1.1	.8	.8
12	1.4	1.4	1.7	1.1	7.5	5.9	2.4	1.0	1.2	1.1	.9	.8
13	1.4	1.4	1.7	1.1	7.5	5.4	2.4	1.0	1.2	1.1	.9	.8
14	1.4	1.3	1.7	1.1	7.4	4.9	2.3	1.1	1.1	1.1	.9	.9
15	1.5	1.3	1.7	1.0	7.3	4.4	2.3	1.1	1.1	1.1	.9	.9
16	1.5	1.2	1.6	1.0	7.3	4.2	2.2	1.2	1.1	1.1	.9	.9
17	1.5	1.2	1.6	1.0	7.5	4.0	2.1	1.3	1.0	1.1	.9	.9
18	1.4	1.2	1.5	.9	7.6	3.8	2.1	1.3	1.0	1.1	.9	.9
19	1.4	1.3	1.5	.9	7.8	3.6	2.0	1.4	1.0	1.0	.9	.9
20	1.3	1.3	1.4	.8	8.0	3.4	1.9	1.2	1.0	1.0	.9	.9
21	1.3	1.3	1.4	.8	8.2	3.2	1.9	1.0	1.0	1.0	.9	.9
22	1.2	1.3	1.3	.7	8.4	3.0	1.8	.8	1.0	1.0	.9	1.0
23	1.1	1.4	1.3	.7	8.7	2.8	1.8	.7	1.1	1.0	.9	1.0
24	1.1	1.4	1.3	.7	8.3	3.1	1.7	.5	1.1	.9	.9	1.0
25	1.1	1.4	1.3	.6	8.0	3.4	1.7	.4	1.1	.9	.9	1.0
26	1.1	1.4	1.3	1.4	7.6	3.6	1.6	.5	1.1	.9	.9	1.1
27	1.1	1.5	1.3	2.1	7.3	3.9	1.6	.6	1.1	.8	.9	1.1
28	1.1	1.5	1.3	2.9	6.9	4.2	1.8	.7	1.1	.8	.9	1.1
29	1.1	1.3	1.3	3.6	6.5	4.4	2.0	.9	1.1	.8	.8	1.1
30	1.0	1.3	1.3	4.3	6.2	4.7	2.2	1.0	1.1	.7	.8	1.1
31	1.0	1.3	1.3	5.8			2.4	1.2		.7		1.1
Sum	47.9	39.3	46.5	40.7	223.9	190.6	77.3	43.3	35.8	31.6	24.9	28.0
Avg.	1.5	1.4	1.5	1.4	7.2	6.4	2.5	1.4	1.2	1.0	.8	.9
Vol.^f	95.7	78.6	91.6	81.1	444	379	154	85.9	71.3	62.4	50.3	55.9

RIO SAN JUAN AT CAMARGO, TAMAULIPAS

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,230	484	519	83.3	23.0	1.4	6.7	7.1	4.2	5.3	8.5	6.0
2	1,110	484	547	79.5	17.3	1.1	6.4	7.4	4.2	5.7	8.8	6.4
3	992	484	579	75.2	17.0	1.1	6.4	7.8	3.9	5.7	8.8	6.7
4	992	484	579	71.0	16.6	7.4	6.0	7.8	3.9	5.7	8.8	7.1
5	992	494	579	67.1	16.2	16.6	5.7	7.4	3.5	5.3	8.8	7.8
6	992	505	533	62.9	16.2	22.6	5.7	7.4	3.5	5.3	8.8	8.1
7	1,070	516	487	58.6	15.9	13.8	5.3	7.1	3.2	4.9	8.8	8.8
8	1,050	516	441	66.4	15.5	13.4	4.9	6.7	3.2	4.9	8.8	9.2
9	1,020	516	438	74.2	15.2	13.4	4.9	6.7	2.8	4.6	8.5	9.9
10	999	516	431	81.6	14.1	13.1	4.6	6.4	2.8	4.6	8.5	10.2
11	978	466	424	89.3	12.7	12.7	4.2	6.4	2.8	5.7	8.5	9.9
12	957	413	420	83.3	11.7	12.4	3.9	6.0	3.2	6.7	8.1	9.9
13	936	413	417	77.7	10.2	12.4	3.5	6.0	3.2	7.8	8.1	9.5
14	936	413	410	71.7	9.2	12.0	3.9	5.7	3.2	8.5	8.1	9.5
15	936	413	410	66.0	7.8	11.7	4.2	5.3	3.2	9.5	8.1	9.2
16	936	413	410	60.0	6.7	11.7	4.6	5.3	3.2	10.6	8.1	8.8
17	727	427	277	54.4	6.7	11.7	4.9	4.9	3.2	10.6	8.1	8.8
18	727	441	261	48.4	6.4	11.3	5.3	4.9	3.2	10.9	8.1	8.5
19	731	456	245	49.8	6.4	11.3	5.7	4.6	3.5	10.9	8.1	8.5
20	731	466	228	50.9	6.0	11.3	6.0	4.6	3.5	10.9	8.1	8.1
21	992	480	212	52.3	6.0	11.3	6.4	4.6	3.9	11.3	8.1	7.8
22	512	494	196	53.7	5.7	10.9	6.7	4.6	3.9	11.3	7.4	7.8
23	512	509	180	54.7	5.7	10.9	6.4	4.6	4.2	11.3	7.1	7.4
24	512	494	167	56.1	5.3	10.6	6.0	4.6	4.6	10.9	6.4	7.4
25	593	484	155	57.6	4.6	9.9	5.3	4.6	4.6	10.6	5.7	7.1
26	678	470	142	51.9	4.2	9.2	4.9	4.6	4.9	10.2	5.3	7.1
27	678	456	130	45.9	3.9	8.8	4.6	4.6	4.9	9.9	4.6	6.7
28	678	487	117	40.3	3.5	8.5	4.9	4.2	4.9	9.5	4.9	6.4
29	614		105	34.6	2.8	7.8	5.7	4.2	5.3	9.2	5.3	6.4
30	547		91.8	29.0	2.5	7.1	6.0	4.2	5.3	8.8	5.7	6.4
31	484		87.6	2.1			6.4	4.2		8.5		6.4
Sum	25,842	13,194	10,218.4	1,847.4	297.1	317.4	166.1	174.5	113.9	255.6	229.0	247.8
Avg.	834	471	330	61.6	9.6	10.6	5.4	5.6	3.8	8.2	7.6	8.0
Vol.^f	51,270	26,170	20,270	3,660	589	629	329	346	226	508	455	491

^f Volume in acre-feet

CONTRIBUTIONS FROM RIO SAN JUAN — Below Fort Ringgold Station
Mean Daily Discharge in Second-Feet

PUERTECITOS, HUIZACHE, AND MORILLO DRAINS

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	49.7	41.5	50.0	44.0	104	106	87.7	39.9	65.1	71.7	38.2	32.9
2	49.7	41.8	49.2	45.8	104	96.2	88.5	39.9	66.6	78.2	37.6	33.2
3	49.7	41.9	48.4	48.2	104	86.4	87.4	39.9	66.8	84.5	37.0	33.3
4	49.0	42.1	47.6	50.5	104	89.4	86.2	39.8	67.0	90.8	36.7	33.3
5	48.2	42.3	46.8	52.8	104	92.3	85.1	39.8	67.2	97.0	36.3	33.4
6	47.5	42.3	46.3	55.1	104	95.3	83.9	42.3	67.4	93.9	36.0	33.6
7	46.7	42.2	45.8	57.4	104	98.3	82.8	44.6	67.6	90.8	35.6	33.7
8	46.0	42.1	45.3	59.8	105	101	81.6	47.1	63.9	87.7	35.7	33.8
9	45.2	42.0	44.8	62.3	105	104	80.6	49.7	60.2	84.5	35.7	34.0
10	44.5	41.9	44.4	64.9	106	107	79.5	52.2	56.9	81.4	35.8	34.1
11	44.4	41.8	43.9	67.5	107	106	78.5	54.5	53.5	77.8	35.8	33.9
12	44.3	41.7	43.4	70.0	107	105	77.4	57.0	50.1	74.2	35.9	33.5
13	44.3	41.6	42.9	72.5	108	104	76.3	58.1	46.7	70.6	35.9	33.1
14	44.2	41.5	41.4	75.1	109	103	75.3	59.0	43.3	67.0	35.7	32.6
15	44.1	41.8	39.8	77.7	110	102	74.2	60.1	42.3	63.4	35.5	32.2
16	44.1	42.2	38.3	80.2	112	100	73.1	61.1	41.2	59.8	35.2	31.8
17	44.0	42.5	36.8	82.7	113	99.3	69.9	62.2	40.0	58.3	35.0	31.4
18	43.9	43.4	35.2	85.3	115	97.3	66.6	63.1	39.0	56.7	34.7	30.9
19	43.9	44.3	33.7	87.9	116	95.2	63.4	64.2	39.3	55.2	34.5	30.5
20	43.8	45.2	32.1	90.4	117	93.2	60.2	62.7	39.7	54.2	34.3	30.1
21	43.8	46.2	30.6	93.0	123	91.1	57.0	61.1	40.1	53.3	34.0	29.7
22	43.7	47.0	29.0	95.5	128	89.0	53.7	59.6	41.8	52.3	33.7	29.3
23	43.6	48.0	27.5	98.1	133	87.0	51.8	58.1	43.6	51.3	33.3	28.9
24	43.0	48.9	29.3	101	139	84.9	49.8	56.6	45.4	49.4	32.9	28.4
25	42.4	49.8	31.1	101	144	82.9	47.9	58.0	47.1	47.6	32.5	27.8
26	41.9	50.7	33.0	102	150	83.7	45.9	59.0	48.7	45.7	32.3	27.1
27	41.1	51.7	34.9	103	155	84.5	44.0	59.9	50.3	44.3	32.1	26.5
28	40.8	50.8	36.7	104	145	85.3	42.1	60.8	51.9	42.9	32.3	25.8
29	41.0		38.5	104	135	86.1	40.1	61.7	58.5	41.6	32.5	25.1
30	41.2		40.3	104	126	86.9	40.0	62.7	65.0	40.2	32.7	25.1
31	41.4		42.2		116		40.0	63.6		38.8		25.1
Sum	1,381.1	1,239.2	1,229.2	2,335.7	3,652	2,842.3	2,070.5	1,698.3	1,576.2	2,005.1	1,045.4	954.1
Avg.	44.6	44.3	39.7	77.9	118	94.7	66.8	54.8	52.5	64.7	34.8	30.8
Vol.†	2,740	2,460	2,440	4,630	7,240	5,640	4,110	3,370	3,130	3,980	2,070	1,890

MORILLO DRAIN

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	31.4	27.6	31.2	25.5	74.7	72.4	64.7	25.7	41.3	51.7	24.3	22.7
2	31.1	27.6	30.9	27.1	74.2	62.8	66.4	25.9	42.4	57.7	23.9	22.9
3	30.9	27.6	30.5	28.9	73.7	53.1	65.5	26.0	43.6	63.6	23.5	22.8
4	30.5	27.5	30.3	30.6	73.3	55.9	64.5	26.2	44.8	69.6	23.3	22.8
5	30.2	27.5	29.9	32.4	72.8	58.7	63.6	26.3	46.0	75.6	23.1	22.7
6	29.8	27.5	29.9	34.2	72.4	61.5	62.7	28.6	47.1	72.1	23.0	22.7
7	29.3	27.4	29.9	36.0	72.4	64.3	61.7	30.9	48.3	68.7	22.8	22.6
8	29.0	27.3	29.9	37.8	72.4	67.1	60.8	33.2	45.6	65.3	22.6	22.6
9	28.6	27.3	29.9	39.3	72.4	69.9	59.9	35.5	42.9	61.8	22.5	22.6
10	28.2	27.2	29.9	40.8	72.4	72.7	58.9	37.8	40.3	58.4	22.3	22.5
11	28.1	27.1	29.9	42.3	72.4	71.5	58.0	40.0	47.6	54.9	22.1	22.5
12	28.1	27.0	29.8	43.8	72.4	70.3	57.1	42.3	34.9	51.5	22.0	22.2
13	28.1	26.9	29.8	45.3	72.4	69.1	56.1	43.0	32.3	48.0	21.8	21.9
14	28.1	26.8	28.0	46.8	73.3	68.1	55.2	43.8	29.6	44.6	21.8	21.6
15	28.0	26.8	26.2	48.3	74.2	66.7	54.3	44.5	29.2	41.1	21.8	21.3
16	28.0	26.7	24.4	49.8	75.0	65.5	53.4	45.2	28.8	37.7	21.8	21.0
17	28.0	26.6	22.6	52.3	75.9	64.3	50.4	46.0	28.4	36.3	21.8	20.8
18	28.0	27.1	20.8	54.8	76.8	63.1	47.4	46.7	28.0	34.8	21.8	20.4
19	28.0	27.6	19.1	57.3	77.7	61.8	44.4	47.4	27.7	33.3	21.8	20.2
20	27.9	28.1	17.3	59.9	78.6	60.6	41.4	45.1	27.3	32.4	21.8	19.9
21	27.9	28.7	15.5	62.4	84.6	59.4	38.4	42.7	26.9	31.5	21.8	19.6
22	27.9	29.2	13.7	64.9	90.6	58.2	35.4	40.4	27.9	30.6	21.8	19.3
23	27.9	29.7	11.9	67.4	96.7	57.0	33.9	38.0	28.9	29.7	21.8	19.0
24	27.8	30.2	13.4	69.9	103	55.8	32.5	35.7	29.8	28.7	21.8	18.8
25	27.8	30.8	14.9	71.1	109	54.6	31.0	36.3	30.8	27.8	21.8	18.2
26	27.8	31.3	16.4	72.2	115	56.3	29.6	37.0	31.8	26.9	22.0	17.7
27	27.8	31.8	17.9	73.3	121	58.0	28.2	37.6	32.8	26.5	22.1	17.2
28	27.7	31.5	19.5	74.4	111	59.6	26.7	38.2	33.8	26.1	22.3	16.7
29	27.7		21.0	75.6	101	61.3	25.3	38.8	39.8	25.6	22.4	16.2
30	27.7		22.5	75.1	91.8	63.0	25.4	39.5	45.7	25.2	22.6	16.2
31	27.7		24.0	82.1				40.1		24.8		16.2
Sum	88.5	788.4	740.9	1,539.5	2,585.2	1,882.6	1,478.4	1,164.4	1,074.3	1,362.5	670.2	633.8
Avg.	28.5	28.2	23.9	51.3	83.4	62.8	47.7	37.6	35.8	44.0	22.3	20.4
Vol.†	1,760	1,560	1,470	3,050	5,130	3,730	2,930	2,310	2,130	2,700	1,330	1,260

† Volume in acre-feet

RIO GRANDE AT FORT RINGGOLD, RIO GRANDE CITY, TEXAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights, located about 1 river mile below Rio Grande City, Texas, 3.9 river miles below the confluence of the Río San Juan with the Rio Grande, and 1,014.3 river miles below the American Dam at El Paso, Texas. The zero of the gage is 100.00 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 66 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1955 through December 1959. Records composed of the addition of discharges of the Rio Grande at Roma, Texas, and the Río San Juan at Santa Rosalia, Tamaulipas, are available for May, June and October 1914; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June 1922; September 1923; and January 1924 through December 1931. Records are also available for the station "Rio Grande Near Rio Grande City" for 1932 through 1954.

REMARKS: Reservoirs, diversions, and drainage returns modify the river flow at this station. Except for tributary inflows and intervening diversions below Falcón Dam, flow at this station is controlled largely by releases from Falcón Reservoir, 39.9 river miles upstream.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow was 198,800 second-feet, which occurred September 5, 1932, at an elevation of 157.4 feet at the station 3 miles downstream. Zero flow occurred several days in June and July 1953.

Average Flow in Second-Feet ‡

Daily:	Max.	101,000	Oct. 17-18, 1958	Min.	14.6	April 13, 1957
Monthly:	Max.	49,600	Oct. 1958	Min.	235	March 1957
Yearly:	Max.	9,140	1958	Min.	2,260	1957

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.			
1	1,720	6,600	6,860	4,130	2,700	4,670	4,150	935	4,290	4,840	477	789			
2	1,670	6,570	6,800	4,300	2,800	5,120	3,760	712	4,810	4,030	2,700	836			
3	1,660	6,490	7,340	4,220	3,150	6,070	3,600	1,140	5,020	4,110	782	859			
4	1,650	6,630	6,760	4,240	3,020	5,830	2,710	1,210	4,930	3,840	388	1,170			
5	1,580	6,550	6,480	4,080	3,350	7,600	3,770	1,250	4,720	3,200	290	1,270			
6	1,730	6,610	6,850	4,250	3,340	7,170	4,600	1,610	4,870	2,840	925	1,040			
7	1,770	6,490	6,800	4,270	3,520	4,580	4,420	1,780	5,540	1,310	475	1,410			
8	1,730	6,510	6,850	3,870	3,650	5,350	4,760	1,360	5,830	1,950	325	1,270			
9	1,710	6,520	6,830	3,270	5,690	4,770	5,950	1,440	5,670	1,410	1,080	687			
10	1,690	6,480	6,740	2,920	5,670	5,250	5,780	1,470	5,440	2,130	1,630	1,170			
11	1,690	6,510	7,070	3,010	5,560	7,390	5,690	1,130	5,300	2,210	1,610	1,800			
12	1,670	6,500	6,550	3,130	5,730	8,340	5,650	1,120	4,650	* 1,650	912	2,030			
13	1,690	6,500	6,520	2,940	5,240	7,750	5,020	1,750	3,640	1,270	876	1,080			
14	2,500	6,530	6,520	2,990	5,950	6,600	4,850	1,980	4,090	2,650	851	897			
15	4,820	6,580	6,270	3,000	6,690	5,990	4,560	2,060	4,440	1,310	581	1,270			
16	5,700	6,580	6,120	3,030	7,450	3,520	3,950	1,770	4,420	926	403	1,530			
17	5,640	6,560	6,230	2,950	8,800	2,250	4,350	2,100	4,530	1,620	290	996			
18	5,640	6,420	6,270	2,910	8,910	1,660	4,100	2,370	4,400	1,400	441	1,120			
19	5,530	6,450	6,810	2,890	8,840	1,270	3,570	2,530	4,190	1,840	452	2,640			
20	5,670	6,430	6,350	2,840	7,200	1,920	2,950	2,160	3,900	1,990	452	2,770			
21	5,700	6,610	6,050	2,870	6,790	2,650	2,800	2,610	4,450	1,860	505	2,470			
22	5,550	6,550	6,240	2,860	6,640	2,750	3,160	3,070	4,590	1,020	873	2,440			
23	6,360	6,600	6,300	2,830	7,590	2,830	3,020	3,260	4,530	992	928	2,840			
24	6,390	6,400	6,390	2,870	4,180	2,490	3,440	4,370	4,920	981	960	3,430			
25	6,650	6,690	6,140	2,780	5,070	2,250	2,350	5,990	4,550	978	749	3,680			
26	6,620	6,730	4,960	2,730	4,410	950	2,570	1,740	4,330	971	1,200	3,760			
27	6,620	6,750	4,280	2,790	4,160	942	2,240	1,120	3,820	1,580	1,460	3,590			
28	6,710	6,820	4,280	2,650	4,020	1,120	2,630	1,360	4,180	761	1,420	3,520			
29	6,730	4,340	2,760	2,980	3,610	2,990	3,100	4,400	558	1,030	3,940				
30	6,600	4,300	2,780	2,840	3,660	2,680	3,680	4,540	488	812	4,060				
31	6,600	4,480		4,640		1,600	4,000		477		4,010				
Sum	183,660	97,160	126,352		66,177		57,192		64,374						
	127,990	190,780	160,580		117,670		138,990		25,877						
Current Year 1959												Period 1955-1959			
Month	Extreme Gage Feet			Extreme Second-Feet			Average Second-Feet			Total			Acre-Feet		
	High	Low	Day	High	Day	Low	Average	Second-Feet	Acre-Feet	Average	Maximum	Minimum			
Jan.	31.65	27.31	27	7,990	5	1,390	4,130	254,000	234,220	349,000	70,100				
Feb.	31.90	29.44	† 27	8,530	24	3,830	6,560	364,000	208,900	364,000	25,500				
Mar.	31.97	28.19	† 6	8,680	27	1,930	6,150	378,000	147,500	378,000	14,400				
Apr.	30.81	27.60	6	6,070	30	1,350	3,240	193,000	193,020	340,000	75,100				
May	32.59	27.35	17	9,240	1	1,370	5,180	319,000	327,800	521,000	231,000				
June	32.47	26.52	12	9,020	28	619	4,210	251,000	319,400	434,000	197,000				
July	31.17	26.89	9	6,770	31	883	3,800	233,000	110,720	233,000	22,300				
Aug.	32.22	26.40	25	8,570	2	545	2,130	131,000	137,800	198,000	25,000				
Sept.	31.70	27.80	8	7,660	27	1,800	4,630	276,000	182,480	276,000	89,400				
Oct.	31.25	26.17	1	6,900	† 30	410	1,840	113,000	694,500	3,047,000	30,000				
Nov.	30.04	25.83	2	5,040	17	238	863	51,300	345,340	1,442,000	30,000				
Dec.	30.37	26.37	29	5,530	† 2	499	2,080	128,000	232,600	540,000	134,000				
Yearly	32.59	25.83		9,240	238	3,720	2,691,300	3,134,280	6,619,700	1,637,900					

* Partly estimated † And other days ‡ Period 1955-1959

RIO GRANDE BELOW ANZALDUAS DAM

DESCRIPTION: Water-stage recorder and cable with stand-up cable car equipped for winch and heavy weights located .5 mile below Anzalduas Dam, 12.2 river miles above the international highway bridge between Hidalgo, Texas and Reynosa, Tamaulipas, 1,077.1 river miles below the American Dam at El Paso, and 171.1 river miles from the Gulf of Mexico. An auxiliary recorder 575 feet upstream is used for extremely low flows. The zero of both gages is 82.61 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 95 meter measurements during the year, 91 by the Mexican and 4 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1, 1952 through December 31, 1959.

REMARKS: Except during local storms, flow at this station is controlled largely by releases from Falcón Reservoir and by diversions into Anzalduas Canal. Excessive upstream flood flows are partly diverted into the Mission Inlet of the United States floodway system before reaching this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 63,920 second-feet on October 19, 1958 with a gage height of 28.87 feet. Min. periods of no flow have occurred on several occasions in 1953, 1954, 1956 and 1957.

Average Flow in Second-Feet

Daily:	Max. 63,570	Oct. 19, 1958	Min. 0	Occasionally
Monthly:	Max. 37,830	Oct. 1958	Min. 5.5	Mar. 1957
Yearly:	Max. 6,410	1958	Min. 158	1957

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.3	4,410	4,560	1,470	1,030	1,190	840	15.5	11.7	2,430	491	667
2	3.9	4,480	4,590	1,350	735	1,360	1,150	14.8	11.7	2,780	413	569
3	3.5	4,410	4,590	1,230	1,200	1,620	1,080	14.1	11.7	3,050	2,010	565
4	3.5	4,310	4,660	1,140	1,580	2,220	957	13.1	125	3,040	1,170	614
5	3.2	4,450	1,290	1,480	1,890	448	12.4	280	2,740	501	819	
6	3.2	4,410	4,310	1,190	1,170	1,920	558	11.7	452	2,080	319	1,080
7	2.8	4,560	4,380	1,090	1,040	1,730	872	13.1	533	1,570	484	939
8	2.5	4,410	4,340	1,020	1,100	526	890	14.5	925	759	696	1,110
9	2.5	4,380	4,340	989	1,430	378	978	15.5	1,240	1,450	321	1,040
10	2.1	4,310	4,340	692	2,030	374	1,290	17.0	713	1,280	480	685
11	2.1	4,200	4,340	477	1,740	501	1,300	18.4	494	1,830	1,240	636
12	1.8	4,240	4,410	243	1,120	1,560	1,490	19.8	802	1,770	1,410	1,270
13	1.8	4,240	4,200	174	946	2,110	1,440	21.2	1,180	1,390	890	1,690
14	1.8	4,270	4,200	11.7	420	1,900	1,100	20.5	1,070	1,240	713	1,010
15	1.8	4,310	4,200	7.1	682	1,290	809	19.8	1,630	1,270	756	682
16	1,010	4,240	4,030	7.1	1,010	1,250	1,120	19.1	2,010	682	632	840
17	2,440	4,240	3,850	7.1	1,130	1,160	872	18.4	2,020	766	392	1,080
18	3,430	4,270	3,850	11.7	1,110	682	826	17.7	2,100	1,400	265	491
19	3,810	4,240	3,880	9.5	1,090	360	434	17.3	2,100	1,350	215	273
20	3,400	4,310	4,240	11.7	1,090	710	108	16.6	2,030	1,650	242	152
21	3,330	4,310	4,060	7.1	749	1,410	11.3	15.9	1,600	1,800	257	249
22	3,330	4,450	3,960	91.5	735	2,040	7.8	15.2	1,870	1,660	283	78.8
23	3,250	4,380	3,920	346	886	2,100	8.8	14.8	1,990	1,040	385	72.4
24	4,270	4,380	3,880	622	1,250	2,090	9.9	14.1	2,040	911	512	72.4
25	4,240	4,310	3,880	1,500	554	1,840	10.9	13.4	2,470	911	569	299
26	4,270	4,410	3,740	1,830	593	1,580	12.0	12.7	2,300	763	653	2,330
27	4,200	4,480	2,610	1,700	667	1,010	13.1	12.4	2,400	816	720	2,750
28	4,270	4,560	1,900	1,550	646	780	14.1	11.7	1,800	1,500	855	2,300
29	4,480	1,820	1,430	547	607	15.2	11.7	2,030	982	1,080	2,260	
30	4,450	1,620	1,350	424	724	16.2	11.7	2,210	689	922	2,590	
81	4,340	1,460		420		15.5	11.7		516		2,840	
Sum	121,970	118,680	22,847.5	30,604	38,912	475.8	40,449.1	46,115	19,876	32,053.6	58,561.8	

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Period 1952-1959				
	High	Low	Day	High	Low			Average	Maximum	Minimum		
Jan.	8.10	.92	24	5,470	† 12	1.8	1,890	116,200	72,747	166,200		
Feb.	7.97	6.82	5	5,160	† 4	4,360	4,360	241,900	73,530	241,900		
Mar.	7.55	2.33	3	4,800	31	1,240	3,830	235,500	79,248	235,500		
Apr.	3.28	- 1.31	126	1,880	† 15	7.1	762	45,330	58,085	155,700		
May	3.58	.26	10	2,110	18	283	987	60,720	103,601	202,400		
June	3.61	.69	4	2,310	19	153	1,300	77,180	110,985	214,900		
July	2.89	- 1.54	13	1,620	22	7.8	603	37,090	53,779	252,400		
Aug.	1.64	- 1.77	13	21.2	† 6	11.7	15.3	943	55,655	241,200		
Sept.	4.46	- 1.80	26	2,860	† 1	11.7	1,350	80,240	100,245	468,500		
Oct.	5.31	.07	4	3,430	31	441	1,490	91,480	361,811	2,326,000		
Nov.	3.41	.92	3	2,300	19	198	663	39,400	211,029	1,438,000		
Dec.	4.76	- 1.74	31	3,260	25	69.2	1,030	63,590	99,525	540,100		
Yearly	8.10	- 1.80		5,470		1.8	1,500	1,089,573	1,380,240	4,640,968		
										114,749		

† And other days

RIO GRANDE FLOODWAY DISCHARGES LOWER RIO GRANDE VALLEY

On the United States Side

Part of the excess water from floods entering the Lower Rio Grande Valley is diverted from the river through the United States floodway system, with inlets located approximately 6 miles upstream (Mission Inlet) and 7 miles downstream (Hackney Lake Inlet) respectively from Anzalddas Dam.

Floodwater entering the system through the Mission Inlet is measured at the Mission Branch Station South of McAllen and floodwater entering through the Hackney Lake Inlet is measured at the Hackney Branch Station South of McAllen. ** These waters join at a point 5 miles northeast of Hidalgo and flow eastward in the Main Floodway for about 19 miles to a point 3 miles southwest of Mercedes, Texas. Here the floodway divides, one channel going northeastward through the Arroyo Colorado Floodway to the Gulf of Mexico, and the other going to the Gulf via the North Floodway, traveling first northward and then eastward to the Gulf. The Arroyo Colorado Floodway is measured at U.S. 83 Highway Bridge south of Harlingen, and the North Floodway flow is measured first at U.S. 83 Highway Bridge west of Mercedes and again at U.S. 77 Highway Bridge near Sebastian.

In 1959 no flood flow was diverted through this floodway system.

On the Mexican Side

Part of the excess water from floods entering the Lower Rio Grande Valley is diverted from the river through the Mexican floodway system, with inlets located approximately 38 miles (Retamal Heading), 51 miles (San Rafael), and 107 miles (Floodway No. 2) respectively downstream from Anzalddas Dam. Floodway No. 3, 1.2 miles above the Brownsville-Matamoros Bridge, is greatly obstructed and is considered to be inoperative. #

Floodwater diverted through Retamal Heading is measured at a cableway station .9 mile below the headgate. It flows through Retamal Canal into Culebrón and Villa Cárdenas Lakes from which it discharges through floodgates into Floodway No. 1 and flows southeastward into the Gulf of Mexico. Floodwater diverted at San Rafael is measured near the intake and flows through San Rafael Drain into Culebrón and Villa Cárdenas Lakes from which it discharges into Floodway No. 1. Floodwater entering Floodway No. 2 is measured at the Matamoros-Reynosa highway crossing and flows south and east into the Gulf of Mexico.

In 1959 no flood flows were diverted into this floodway system. Diversions for irrigation purposes through Retamal Canal may be found on page 63.

** In water bulletins prior to 1958 these stations were called "North Floodway South of McAllen" and "South Floodway South of McAllen", respectively.

Floodway No. 2 was previously called Floodway No. 3 (west branch) while Floodway No. 3 was previously East Branch of Floodway No. 3.

RETURN FLOW TO THE RIO GRANDE AT PONIENTE DRAIN
West of Reynosa, Tamaulipas

DESCRIPTION: Water-stage recorder on downstream side of railroad bridge 650 feet below drain heading and cable with cable-car 300 feet farther downstream. This drain branches off the left side of the Anzaldas Canal 5.16 miles below the canal intake and enters the Rio Grande 1,088.6 river miles below the American Dam at El Paso, Texas. The zero of the gage is 85.83 feet above mean sea level U.S.C. & G.S. datum.

RECORDS: Based on 39 meter measurements during the year, 38 by the Mexican and 1 by the United States Section of this Commission and a continuous record of gage heights. Computations by shifting channel methods. Records available: 1953 through 1959.

REMARKS: Flows passing this station represent that portion of water diverted through Anzaldas Canal which is not used by Mexico. In 1959, this drain was largely used to by-pass Rio Grande water during the construction of Anzaldas Dam.

EXTREME FLOWS FROM RECORDS: Max. 3,810 second-feet on January 18, 1954. Min. no flow the greater part of the time.

Average Flow in Second-Feet

Daily:	Max. 3,810	Jan. 18, 1954	Min. 0	Frequently
Monthly:	Max. 2,390	Mar. 1959	Min. 0	Frequently
Yearly:	Max. 1,270	1959	Min. 0	1955

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,580	2,390	2,390	2,390	340	1,080	1,890	2,070	1,980	25.4	0	0
2	2,320	2,390	2,390	2,400	172	1,080	1,840	893	1,770	25.4	0	0
3	2,150	2,390	2,390	2,340	11.7	1,090	1,800	876	1,690	25.4	0	0
4	2,070	2,390	2,390	2,300	10.6	1,440	1,800	876	1,520	25.4	0	0
5	2,010	2,040	2,400	1,720	10.6	1,830	1,800	876	1,520	25.4	0	0
6	2,030	2,440	2,400	2,300	9.9	1,860	1,800	876	1,490	25.4	0	0
7	2,080	2,060	2,390	2,290	9.2	1,720	1,790	876	1,520	25.4	0	0
8	2,140	2,480	2,390	2,300	9.2	1,540	1,840	876	1,500	275	0	0
9	2,130	2,390	2,390	2,290	60.0	1,080	1,800	876	1,490	31.4	0	0
10	2,100	2,390	2,390	2,300	816	1,090	2,140	957	1,500	25.4	0	0
11	2,040	2,390	2,400	2,400	1,340	1,080	2,440	999	1,500	25.4	0	0
12	2,010	2,390	2,390	2,770	1,660	1,310	2,430	886	1,010	25.4	0	0
13	1,960	2,390	2,390	2,800	1,670	2,560	2,430	890	618	25.4	0	0
14	1,950	2,390	2,390	2,800	1,430	2,800	2,450	1,000	26.8	25.4	0	0
15	2,330	2,390	2,390	2,820	1,090	2,370	2,100	1,590	26.8	25.4	0	0
16	2,190	2,390	2,390	2,800	1,080	1,640	1,390	1,740	26.8	25.4	0	0
17	2,300	2,390	2,390	2,810	1,120	1,210	1,390	1,510	26.8	25.4	0	63.2
18	2,380	2,390	2,390	2,810	1,980	1,220	1,920	1,180	26.8	25.4	0	396
19	1,770	2,390	2,390	2,830	2,270	777	2,460	1,260	135	629	0	1,080
20	2,380	2,400	2,390	2,760	2,240	14.8	2,440	1,350	25.4	68.9	0	
21	2,390	2,400	2,390	1,970	1,820	12.7	1,880	1,380	24.0	25.4	0	1,100
22	2,380	2,390	2,390	1,320	1,450	11.7	1,270	1,490	25.4	17.7	0	1,270
23	2,390	2,390	2,390	1,780	1,450	24.4	2,130	1,440	25.4	17.7	0	1,730
24	1,910	2,390	2,390	1,070	1,450	116	2,440	2,000	25.4	14.1	0	1,430
25	2,380	2,390	2,390	335	2,120	52.6	2,000	2,470	25.4	14.1	0	.996
26	2,390	2,390	2,390	335	1,890	12.7	1,390	2,480	25.4	10.6	0	24.7
27	2,390	2,390	2,390	343	1,890	12.7	1,420	1,250	25.4	7.1	0	10.6
28	2,390	2,390	2,390	339	1,910	12.7	1,400	357	25.4	.7	0	7.1
29	2,390		2,390	339	1,550	586	1,410	879	25.4	.4	0	7.1
30	2,160		2,390	339	1,080	1,860	2,210	1,680	25.4	.4	0	7.1
31	2,390		2,390	1,080		2,240	2,110			.4		
Sum	68,480	66,400	74,120	58,400	35,019.2	31,493.3	59,740	39,993	19,546.8	1,025.3	0	8,757.9

Current Year 1959

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High		Day	High				Average	Maximum	Minimum		
	High	Low		Day	High							
Jan.	6.10	.82	16	2,610	24	0	2,210	135,800	37,067	135,800		
Feb.	6.43	.75	7	2,770	† 5	17.7	2,370	131,700	23,479	131,700		
Mar.	5.84	5.54	31	2,460	31	2,280	2,390	147,200	23,960	147,200		
Apr.	6.69	.89	† 15	2,860	24	290	1,950	115,900	31,590	115,900		
May	6.33	1.02	18	2,660	† 7	9.2	1,130	69,490	29,926	79,770		
June	6.46	.97	† 13	2,800	† 22	11.7	1,050	62,460	21,204	67,480		
July	5.97	3.35	† 10	2,460	22	1,110	1,930	118,500	34,864	118,500		
Aug.	6.00	.82	26	2,480	30	21.2	1,290	79,300	35,180	83,010		
Sept.	5.87	.79	1	2,400	21	24.0	652	38,800	26,571	61,200		
Oct.	3.28	.85	8	1,090	† 29	.4	33.1	0	11,145	34,460		
Nov.			† 1	0	† 1	0	0	0	24,677	71,280		
Dec.	5.68		21	2,280	† 1	0	283	17,380	918,570	0		
Yearly	6.69			2,860		0	1,270	918,570	317,163	0		

† And other days Ø Mean daily

RIO GRANDE AT PROGRESO BRIDGE, TEXAS

DESCRIPTION: Water-stage recorder on the downstream side of the center pier of the bridge 2 miles south of Progreso, Texas, .8 mile below Progreso pumping plant, 1,124.4 river miles below American Dam at El Paso, Texas, and 123.3 river miles above the Gulf of Mexico. On October 4, 1956, when the low-flow channel shifted to the left bank, an auxiliary recorder was installed 300 feet above the bridge on the American bank to record such flows. The zero of the gage of both recorders is at 52.56 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 101 meter measurements during the year from the bridge, 90 by the Mexican and 11 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: December 1, 1952 through August 24, 1953; and December 1, 1953 through December 31, 1959.

REMARKS: Except for diversions, tributary inflows and drainage returns below Falcón Dam, flow at this station after August 25, 1953 was controlled largely by releases from Falcón Reservoir, 150 miles upstream. Excessive upstream flood flows are partly diverted through the Mission and Hackney Lake Inlets of the United States floodway system and through Retamal Heading of the Mexican floodway system before reaching this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 19,900 second-feet on October 22, 1958 with a gage height of 23.69 feet. Min. no flow several days in June, July and August, 1953.

Average Flow in Second-Feet

Daily:	Max. 19,740	Oct. 24, 1958	Min. 0	Frequently 1953
Monthly:	Max. 16,730	Oct. 1958	Min. 5.1	June 1953
Yearly:	Max. 3,840	1958	Min. 666	1957

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,860	6,850	6,922	3,510	1,320	1,080	1,710	2,020	1,670	1,480	678	844
2	2,650	6,890	6,886	3,360	1,080	1,510	1,830	1,890	1,570	1,570	636	607
3	2,450	6,920	6,886	3,160	759	1,650	1,950	1,160	1,420	1,880	554	388
4	2,280	6,820	6,992	2,830	1,060	1,870	2,140	770	1,310	2,600	1,300	357
5	2,190	6,710	6,992	2,870	1,140	2,670	2,220	710	1,190	3,030	996	456
6	2,210	6,670	6,780	3,070	1,040	2,830	1,840	696	1,410	2,650	643	720
7	2,190	6,710	6,780	2,920	3,140	1,600	650	1,600	1,960	477	1,030	
8	2,200	6,710	6,816	2,630	678	2,990	1,770	565	1,530	1,400	473	950
9	2,180	6,820	6,745	2,750	819	1,610	1,810	699	1,700	932	717	855
10	2,130	6,670	6,639	2,790	1,320	1,160	1,890	830	1,970	1,130	480	742
11	2,150	6,670	6,639	2,720	2,460	1,070	2,550	745	1,980	1,120	396	547
12	2,080	6,640	6,533	2,760	2,520	1,090	3,040	699	1,930	1,420	872	410
13	2,010	6,570	6,392	2,760	2,270	3,230	3,270	533	1,750	1,350	1,090	961
14	1,950	6,530	6,321	2,690	2,090	3,710	3,160	487	1,650	1,140	855	872
15	2,000	6,570	6,463	2,670	1,380	3,850	2,710	636	978	1,140	759	876
16	2,360	6,600	6,427	2,670	1,290	3,160	1,800	1,370	1,200	1,150	819	540
17	3,020	6,570	6,357	2,620	1,640	2,720	1,580	1,560	1,410	752	777	569
18	4,410	6,530	6,251	2,610	1,950	2,300	1,580	1,130	1,440	710	561	840
19	5,160	6,530	6,251	2,680	2,600	1,850	2,250	795	1,510	1,130	417	724
20	5,370	6,600	6,251	2,650	2,850	1,150	2,390	788	1,710	1,140	336	759
21	5,540	6,640	6,286	2,410	2,720	982	1,910	865	1,690	1,290	333	1,050
22	5,580	6,750	6,321	1,670	1,840	1,460	1,300	999	1,190	1,220	360	1,080
23	5,510	6,820	6,215	1,300	1,610	1,600	901	1,260	1,260	1,090	334	1,030
24	5,540	6,740	5,898	1,520	1,810	1,790	1,590	1,350	1,350	770	266	1,270
25	6,110	6,780	5,756	1,190	2,280	1,770	1,770	1,720	1,370	696	252	1,260
26	6,570	6,750	5,686	1,530	1,960	1,440	1,450	2,210	1,630	780	289	1,220
27	6,600	6,710	5,580	1,810	1,800	1,240	1,240	1,210	1,840	607	463	2,050
28	6,530	6,750	5,015	1,610	1,830	872	1,090	1,160	1,890	766	480	2,340
29	6,670	4,344	1,430	1,800	660	1,110	417	1,330	1,240	735	1,900	
30	6,710	4,096	1,390	1,310	890	1,310	417	1,340	1,010	1,000	1,760	
31	6,710	3,779		1,050			1,940	1,430		784		2,020
Sum	187,520	72,580		56,434			32,771		39,937		31,027	
121,920	191,299		51,099			58,701		45,818		18,348		

Current Year 1959

Month	Extreme Gage Feet			Average Second-Feet			Total Acre-Feet	Period # Dec. 1952-1959			
	Extreme Second-Feet		Average Second-Feet	Acre-Feet	Acre-Feet			Acre-Feet			
	High	Low			Day	High		Average	Maximum	Minimum	
Jan.	13.12	4.99	30	6,780	14	1,940	3,930	241,800	93,726	241,800	
Feb.	13.39	12.63	23	6,930	1 3	6,500	6,700	371,900	89,189	371,900	
Mar.	13.42	8.01	5	7,060	31	3,640	6,190	380,300	91,055	380,300	
Apr.	8.01	3.22	1	3,640	25	992	2,420	144,000	73,476	144,000	
May	6.36	2.03	20	2,880	8	660	1,650	101,300	95,860	146,100	
June	8.14	1.31	15	3,960	30	448	1,880	111,900	99,273	155,700	
July	7.09	2.53	13	3,310	23	833	1,890	116,400	44,383	116,400	
Aug.	5.31	1.25	26	2,330	30	285	1,060	65,020	45,275	65,020	
Sept.	5.09	2.66	27	2,070	15	809	1,530	90,860	55,883	93,380	
Oct.	6.76	1.77	5	3,100	27	572	1,290	79,230	210,692	1,028,000	
Nov.	3.71	.98	4	1,530	124	245	612	36,400	155,308	735,000	
Dec.	5.51	1.35	28	2,450	4	341	1,000	61,580	99,015	487,200	
Yearly	13.42	.98		7,060		245	2,490	1,800,690	1,153,135	2,776,990	
										482,410	

* And other days # Some months missing

RIO GRANDE NEAR SAN BENITO, TEXAS

DESCRIPTION: Water-stage recorder located on the United States side 5.6 miles below San Benito pumping plant, 1,151.7 river miles below the American Dam at El Paso, Texas and 96.5 river miles above the Gulf of Mexico. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 33 meter measurements during the year, 31 by wading during low flow, 2 by boat during medium flows, and a continuous record of gage heights. Computations by shifting channel methods. Records available: November 26, 1952 through August 25, 1953; and December 1953 through December 1959.

REMARKS: Except for diversions, tributary inflows and drainage returns below Falcón Dam, flow at this station, after August 25, 1953, was controlled largely by releases from Falcón Reservoir, 177.3 river miles upstream. Excessive upstream flood flows are partly diverted through the United States and Mexican floodway systems before reaching this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. * 13,600 second-feet October 22-25, 1958 with a gage height of 60.07 feet. Min. no flow occurs frequently.

Average Flow in Second-Feet ‡

Daily:	Max. * 13,600	October 22-25, 1958	Min. 0	Frequently
Monthly:	Max. * 13,100	October 1958	Min. 39.5	Dec. 1956
Yearly:	Max. * 2,930	1958	Min. 200	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,840	* 6,630	* 6,700	* 2,700	* 739	577	307	1,350	560	197	486	473
2	2,720	* 6,780	* 6,630	* 2,510	* 676	558	425	1,520	598	229	443	474
3	2,530*	* 6,840	* 6,500	* 2,400	* 683	543	511	1,140	478	284	281	286
4	2,370*	* 6,790	* 6,620	* 2,310	* 457	520	632	628	328	1,000	313	158
5	2,200*	* 6,590	* 6,750	* 2,340	* 343	936	883	352	143	1,980	755	207
6	2,170	* 6,530	* 6,650	* 2,150	* 392	1,280	795	300	365	2,100	711	283
7	2,260	* 6,490	* 6,500	* 2,050	294	1,700	320	279	482	1,620	559	419
8	2,240	* 6,580	* 6,530	* 1,760	70.0	1,830	* 91.0	333	337	1,130	366	588
9	2,040	* 6,680	* 6,500	* 1,840	48.6	1,130	129	317	392	808	348	413
10	2,020	* 6,600	* 6,250	* 2,210	42.9	228	253	443	617	539	391	426
11	2,070	* 6,570	* 6,300	* 2,240	789	112	475	327	883	875	284	334
12	2,000	* 6,530	* 6,190	* 2,440	1,300	80.8	1,020	271	895	859	322	146
13	1,840	* 6,430	* 6,010	* 2,530	1,170	205	1,410	* 191	892	984	603	296
14	1,820	* 6,330	* 5,810	* 2,440	944	1,210	1,370	* 61.7	879	987	579	796
15	1,880	* 6,360	* 6,070	* 2,440	536	1,990	1,210	* 72.6	518	963	558	589
16	2,000	* 6,390	* 6,080	* 2,390	86.1	2,140	830	* 487	338	897	536	250
17	2,320	* 6,430	* 6,050	* 2,230	340	2,030	303	* 777	555	527	558	116
18	* 3,210	* 6,310	* 5,990	* 2,240	398	1,990	339	515	584	424	629	219
19	* 4,440	* 6,190	* 5,900	* 2,220	695	1,420	546	99.7	562	413	466	346
20	* 5,010	* 6,300	* 5,870	* 2,250	1,070	876	1,000	35.2	829	552	244	295
21	* 5,160	* 6,410	* 5,870	* 2,130	1,080	519	835	44.1	1,000	765	189	161
22	* 5,300	* 6,460	* 6,060	* 1,880	738	522	589	140	767	923	264	119
23	* 5,330	* 6,560	* 5,960	* 1,200	430	800	192	474	517	798	175	157
24	* 5,210	* 6,550	* 5,540	* 1,310	1,090	915	179	641	531	611	104	293
25	* 5,580	* 6,660	* 5,380	* 1,120	1,380	1,100	662	718	284	410	63.0	706
26	* 6,070	* 6,680	* 5,290	* 943	1,670	1,040	939	1,400	282	308	51.2	833
27	* 6,270	* 6,650	* 5,220	* 1,500	1,370	922	540	1,580	648	222	53.0	878
28	* 6,180	* 6,620	* 5,060	* 1,570	1,180	672	315	1,290	707	320	54.0	1,190
29	* 6,340	* 4,530	* 1,270	1,190	336	208	382	474	642	240	682	
30	* 6,510	* 3,810	* 946	1,140	80.0	374	134	207	914	417	369	
31	* 6,520	* 3,120			733	982	481		572		510	
Sum	* 182,940		* 59,559		28,261.8		18,664.0	16,783.3	23,853		13,012	
	* 114,450		* 181,740		23,074.6			16,652	11,042.2			

Current Year 1959

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total	Acre-Feet			
	High	Low	Day	High	Low			Acre-Feet	Average	Maximum	Minimum
Jan.	51.05	40.89	31	* 6,560	14	1,810	* 227,000	*	47,448	* 227,000	2,920
Feb.	51.52	50.40	3	* 6,870	19	* 6,150	* 6,530	*	61,864	* 363,000	3,380
Mar.	51.38	43.95	5	* 6,770	31	2,830	* 5,860	*	360,000	*	2,560
Apr.	43.95	36.00	1	2,830	† 26	813	* 1,990	*	118,000	*	11,500
May	39.87	33.19	26	1,760	10	41.9	744	*	35,828	*	53.8
June	41.42	32.98	16	1,260	30	66.5	942	*	56,100	33,893	62,100
July	38.72	32.00	13	1,470	24	50.0	602	*	37,000	15,059	34.9
Aug.	38.99	33.05	27	1,620	20	27.2	541	*	33,000	14,408	33,300
Sept.	36.72	33.11	21	1,030	5	93.0	555	*	33,000	22,355	58,500
Oct.	40.79	33.00	6	2,160	1	135	769	*	47,300	*	7,710
Nov.	35.50		5	795	26	0	51.2	*	21,900	*	3,840
Dec.	37.60	31.30	28	1,300	22	69.0	420	*	25,800	*	662,000
Yearly	51.52			*	6,870		27.2	*	1,890	*	145,520
								*	1,368,200	*	666,218
								*	2,124,110	*	

* Partly estimated † And other days § Mean daily # Some months missing ‡ Period 1954-1959

RIO GRANDE AT LOWER BROWNSVILLE, TEXAS

DESCRIPTION: Bubbler-type water-stage recorder, operated with bottled nitrogen gas, and cable with stand-up cable car equipped for winch and heavy weights, located 1,000 feet below the El Jardín pumping plant, 6.8 river miles below Brownsville, Texas, and Matamoros, Tamaulipas, 48.8 river miles upstream from the Gulf of Mexico, and 1,199.4 river miles below the American Dam at El Paso, Texas. The zero of the gage is at mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 56 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: January 1934 through December 1959.

REMARKS: Except for diversions, tributary inflows and drainage returns below Falcón Dam, flow at this station, after August 25, 1953 was controlled largely by releases from Falcón Reservoir, 225 river miles upstream. Excessive upstream flood flows are partly diverted into the United States and Mexican floodway systems before reaching this station.

EXTREME FLOWS FROM RECORDS: The greatest recorded flow since January 1934 was 31,700 second-feet, which occurred October 8, 1945, with a gage height of 31.48 feet. Zero flow occurs frequently.

Average Flow in Second-Feet

Daily:	Max.	30,800	Sept. 14, 1942; Oct. 8, 1945		Min.	0	Frequently
Monthly:	Max.	* 23,200	Oct. 1941		Min.	0	June & July 1953
Yearly:	Max.	9,010	1941		Min.	42.1	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,250	6,520	6,590	3,060	1,030	421	284	811	336	156	639	287
2	2,970	6,650	6,610	2,610	* 891	238	284	1,300	542	47.8	514	379
3	2,790	6,770	6,320	2,410	* 858	152	498	1,500	584	102	442	424
4	2,650	6,840	6,250	2,290	* 702	96.6	525	1,260	453	230	324	335
5	2,550	6,780	6,370	2,170	* 431	37.3	632	777	330	970	304	231
6	2,460	6,650	6,450	2,070	298	333	773	453	202	1,620	553	186
7	2,420	6,530	6,420	2,070	260	876	678	346	205	1,810	475	229
8	2,450	6,510	6,350	2,000	190	1,360	345	283	274	1,530	358	300
9	2,390	6,580	6,380	1,870	69.6	1,500	160	295	181	1,150	268	323
10	2,280	6,670	6,310	1,930	44.2	950	67.4	292	136	785	280	245
11	2,240	6,590	6,190	2,190	31.8	266	59.6	388	292	548	357	240
12	2,260	6,560	6,130	2,360	415	50.6	207	338	612	754	285	197
13	2,250	6,530	5,980	2,510	961	21.5	642	243	669	889	292	114
14	2,100	6,460	5,890	2,630	871	80.7	972	185	674	1,010	528	58.4
15	2,060	6,370	5,830	2,620	703	950	1,020	138	674	1,020	550	587
16	2,080	6,350	5,940	2,630	477	1,820	1,030	107	413	986	534	564
17	2,190	6,390	6,010	2,590	173	2,160	748	329	167	921	522	288
18	2,480	6,430	6,030	2,480	94.0	2,200	351	743	224	633	543	171
19	3,100	6,260	5,990	2,530	205	2,050	226	551	339	505	581	123
20	3,920	6,180	5,920	2,600	364	1,560	342	212	352	419	470	269
21	4,580	6,220	5,940	2,510	582	964	725	114	596	527	299	257
22	4,970	6,340	5,950	2,310	590	599	699	72.5	809	730	225	157
23	5,200	6,430	6,080	2,000	475	512	453	92.8	630	899	240	81.4
24	5,260	6,520	5,900	1,380	* 399	719	185	238	333	821	96.4	58.4
25	5,290	6,510	5,560	1,290	* 760	884	63.6	353	299	638	* 15.0	149
26	5,580	6,560	5,340	1,280	913	1,020	554	518	190	458	* 14.0	353
27	5,950	6,600	5,210	1,130	1,120	1,010	815	1,100	225	376	* 13.0	438
28	6,100	6,610	5,100	1,430	982	938	516	1,340	589	306	* 12.0	532
29	6,180	4,870	1,540	762	745	300	1,150	672	356	* 11.0	683	
30	6,320	4,310	1,310	722	474	161	575	436	675	41.0	270	
31	6,440	3,700	693			181	216	907				108
Sum	182,410	63,800	24,987.7			16,320.3		22,778.8		8,637.2		
	112,760	181,920	17,066.6			14,496.6		12,438		9,785.4		

Current Year 1959

Period 1934-1959

Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High		Low	Day	High			Average	Maximum	Minimum
	High	Low	Day	Day	Day			Average	Maximum	Minimum
Jan.	25.47	17.17	31	6,470	† 15	2,050	3,640	224,000	111,507	299,000 ^a
Feb.	25.99	25.12	4	6,870	20	6,150	6,510	362,000	90,589	362,000
Mar.	25.81	20.50	7	6,480	31	3,340	5,870	361,000	82,982	361,000
Apr.	20.51	13.46	1	3,330	27	1,080	2,130	127,000	70,136	* 372,000
May	13.87	7.21	27	1,140	12	19.6	551	33,900	175,520	717,000
June	16.82	6.58	18	2,220	† 12	18.7	833	49,600	213,651	* 1,161,000
July	13.00	6.35	16	1,090	25	34.0	468	28,800	188,753	0
Aug.	14.40	5.93	3	1,520	122	59.2	526	32,400	155,039	679,000
Sept.	11.35	6.83	22	834	10	127	415	24,700	364,971	1,337,000
Oct.	15.41	5.70	7	1,850	2	35.0	735	45,200	343,912	* 1,427,000
Nov.	10.90	1	802	29	g* 11.0	326	19,400	138,842	614,000	1,070
Dec.	11.00	5.38	29	822	14	42.4	279	17,100	110,357	480,000
Yearly	25.99			6,870	g* 11.0		1,830	1,325,100	2,046,259	* 6,526,000
										30,596

^a Estimated * Partly estimated † And other days g Mean daily

OUTFALLS FROM WELLS AND SEWERS INTO THE RIO GRANDE

In Acre-Feet

EL PASO ELECTRIC COMPANY SANTA FE STREET PLANT COOLING WATER WASTE

This outfall enters the Rio Grande 3.3 miles below the American Dam. The 1959 record of outfall was obtained from records of water pumped from the company's wells and use of such water by the city of El Paso.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1959	0	0	.3	.9	.9	1.1	3.2	1.2	1.8	3.3	2.5	.8	16.0
* Average	36.0	34.0	47.7	32.9	60.0	62.5	57.2	43.5	30.3	32.5	24.4	27.8	488.8

EL PASO SEWAGE OUTFALL

This sewage outfall enters the Rio Grande 6.6 river miles below the American Dam. The 1959 record of outfall consists of flows measured by a Parshall meter and estimates by the Department of Water and Sewerage of the city of El Paso of amounts which by-passed the meter, minus estimated diversions between the Sewage Plant and the Rio Grande for irrigation use of 25 acres of land.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1959	1,046	1,255	1,433	1,365	1,503	1,522	1,550	1,490	1,401	1,380	1,281	1,568	16,794
# Average	853	809	880	848	921	974	1,038	1,022	976	982	912	916	11,131

EL PASO COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT NO. 1 SEWAGE OUTFALLS

This water enters the Rio Grande through the sewer system of the El Paso County Water Control and Improvement District No. 1 between Ascarate and Ysleta, Texas, 9 and 15 miles, respectively, below the American Dam. The tabulation includes the outfalls from Disposal Plant No. 1 at Ascarate, Texas and Disposal Plant No. 2, a few miles downstream. Records were furnished by the El Paso County Water Control and Improvement District No. 1.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1959	230	222	237	241	255	231	227	236	210	215	188	214	2,706
# Average	105	95.6	96.9	96.1	99.5	96.7	102	110	108	107	104	106	1,226.8

LAREDO SEWAGE OUTFALL

This sewage outfall enters the Rio Grande 890.8 river miles below the American Dam at El Paso, Texas and immediately above the Laredo Gaging Station. The record is based on estimates by the Texas State Health Department.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1959	270	224	311	297	405	365	329	316	367	299	310	339	3,832
# Average	208	211	252	243	268	253	254	249	224	206	221	224	2,813

BROWNSVILLE SEWAGE OUTFALL

This sewage outfall enters the Rio Grande 3.4 river miles below the Gateway Bridge between Brownsville, Texas and Matamoros, Tamaulipas, 3.4 river miles above Lower Brownsville gaging station and 52.2 river miles above the Gulf of Mexico. Records which are furnished by the city of Brownsville, were not available for years prior to 1957.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1959	235	210	256	207	164	321	218	162	163	176	189	173	2,474
# Average	168	189	234	207	176	233	214	200	166	220	217	207	2,431

* Period 1940-1959, some years missing Ø Period 1936-1959 # Period 1950-1959 † Period 1957-1959

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN
In Thousands of Acre-Feet

Data are presented below for all storage reservoirs in the Rio Grande Basin in the United States and Mexico that exceed 15,000 acre-feet in capacity, except Bluewater Reservoir in the United States (capacity 43,500 acre-feet) for which only partial records have been available since 1950, and also for International Falcón Reservoir on the Rio Grande. The monthly figures represent the water in storage on the last day of each month, in thousands of acre-feet. The capacities indicated are at spillway level. Storage figures greater than the capacity indicate that the water surface was above spillway level.

The reservoirs and the sources of the data are: Rio Grande, Continental, Santa Maria, Terrace and Mountain Home from the State of Colorado, Division of Water Resources; Sanchez from the Sanchez Ditch and Reservoir Company; Costilla from the New Mexico Interstate Stream Commission; El Vado from the Middle Rio Grande Conservancy District; Elephant Butte, Caballo, Alamogordo, McMillan, and Avalon from the United States Bureau of Reclamation; Red Bluff from the Red Bluff Water Power Control District; Willacy from the Willacy County Water Control and Improvement District No. 1; Boquilla, Colina, and Rosetilla from the Northern Electric Power Company of Mexico, S.A.; Francisco I. Madero, Centenario and San Miguel, Venustiano Carranza, Marte Gómez, Culebrón, Villa Cárdenas, and Palito Blanco from the Ministry of Hydraulic Resources of Mexico; International Falcón Reservoir from International Boundary and Water Commission.

In the United States

Month	RIO GRANDE (Capacity 51.1)		CONTINENTAL (Capacity 26.7)		SANTA MARIA (Capacity 43.6)		TERRACE (Capacity 17.7)		MOUNTAIN HOME (Capacity 20.1)	
	1959	#Average 1927-1959	1959	#Average 1928-1959	1959	#Average 1928-1959	1959	#Average 1925-1959	1959	#Average 1924-1959
Jan.	5.1	13.3	"	1.7	5.0	7.5	7.4	2.2	2.4	4.0
Feb.	6.2	14.5	"	2.1	5.4	7.7	7.8	2.4	2.7	4.4
Mar.	7.6	15.8	"	2.9	5.7	7.8	8.8	2.6	3.2	4.0
Apr.	8.8	15.3		5.6	6.3	8.3	10.2	3.8	3.8	5.3
May	8.8	22.0		5.6	8.4	7.9	15.0	5.3	6.6	7.5
June	0	23.7		3.0	8.9	2.6	17.2	3.1	8.3	5.1
July	0	14.2		1.7	6.4	1.1	11.6	0	5.2	5.5
Aug.	0	6.5		1.7	4.3	.8	5.7	0	8.7	2.0
Sept.	0	6.3		1.7	4.4	.8	5.3	0	2.3	3.0
Oct.	2.8	7.4		1.9	4.1	1.9	5.5	3.3	2.4	3.0
Nov.	6.9	10.4	"	2.6	4.4	2.8	6.2	4.9	2.1	2.7
Dec.	9.0	11.9	"	3.3	4.8	3.2	6.7	5.5	2.4	3.7
Avg.	4.6	13.4		2.8	5.7	4.4	8.9	2.8	3.7	3.4
Max.	9.0	52.1		5.6	26.7	8.3	42.1	5.5	17.7	16.4
Min.	0	0		1.7	0	.8	0	0	0	0

Month	SANCHEZ (Capacity 103.2)		COSTILLA (Capacity 15.7)		EL VADO (Capacity 200.3)		ELEPHANT BUTTE (Capacity 2, 206.8)		CABALLO (Capacity 344.0)	
	1959	#Average 1927-1959	1959	#Average 1922-1959	1959	Average 1935-1959	1959	Average 1915-1959	1959	#Average 1938-1959
Jan.	24.1	11.4	"	4.1	4.1	2.2	43.9	977.1	866.0	187.1
Feb.	24.0	11.6	"	5.0	4.5	2.7	39.6	943.7	867.1	241.4
Mar.	24.0	12.2	"	6.3	5.1	2.8	37.7	890.9	852.5	187.0
Apr.	23.8	13.8	"	7.1	6.2	3.6	84.0	844.5	853.1	169.1
May	25.3	19.0		8.4	8.5	37.4	141.6	808.5	972.5	126.2
June	18.0	18.4		6.5	7.9	37.4	127.5	741.3	1,018.1	66.5
July	10.9	13.1		3.9	5.0	21.1	101.5	621.8	962.7	58.2
Aug.	8.7	10.1		3.3	3.4	20.2	73.7	576.4	901.3	56.4
Sept.	8.0	10.2		2.9	2.8	11.9	58.2	532.8	865.2	41.7
Oct.	8.8	10.8	"	3.2	3.1	11.9	53.0	517.5	858.7	58.2
Nov.	9.4	10.8	"	3.7	3.4	2.3	44.6	549.3	862.0	59.2
Dec.	10.6	11.2	"	3.8	3.8	2.1	41.5	586.4	869.7	60.6
Avg.	16.3	12.7		4.8	4.8	13.0	70.6	715.8	895.7	109.3
Max.	25.3	62.4		8.4	15.1	37.4	203.5	988.8	92,302.8	244.8
Min.	8.0	0		2.9	0	2.1	0	516.1	3.3	21.4

" Estimated # Some months missing \$ Daily extreme

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN
In Thousands of Acre-Feet

In the United States

Month	ALAMOGORDO (Capacity 122,0)		MCMILLAN and AVALON (Capacity 38,0)		RED BLUFF (Capacity 310,0)		WILLACY (Capacity 25,0)		TOTAL IN U. S. RESERVOIRS ** (Capacity 3,524.2)	
	1959	#Average 1937-1959	1959	#Average 1908-1959	1959	#Average 1936-1959	1959	#Average 1939-1959	1959	Estimated Average
Jan.	125.3	63.8	42.2	28.4	111.2	108.2	16.4	13.4	1,509.7	1,310.8
Feb.	125.3	67.7	42.0	28.6	114.1	110.4	16.7	12.6	1,537.0	1,335.8
Mar.	124.4	59.6	32.7	26.9	108.1	107.5	14.0	12.1	1,415.1	1,294.6
Apr.	122.1	50.9	17.6	18.4	96.6	89.8	18.7	11.6	1,331.7	1,289.3
May	119.6	59.4	24.8	21.7	103.2	97.6	15.0	12.4	1,301.3	1,502.3
June	122.1	52.9	10.4	20.3	93.5	101.8	16.6	13.0	1,126.1	1,514.7
July	96.6	53.4	16.8	18.1	83.1	87.9	18.2	12.9	935.9	1,363.1
Aug.	104.4	54.4	24.3	16.8	70.0	75.9	14.7	11.3	882.9	1,206.4
Sept.	100.6	52.7	11.2	18.7	63.2	78.0	13.6	13.5	790.4	1,150.2
Oct.	100.2	58.5	9.2	21.6	65.5	92.1	16.5	13.8	803.3	1,186.6
Nov.	102.6	58.3	11.2	23.1	68.9	96.2	14.6	13.6	841.1	1,214.9
Dec.	108.6	62.6	14.0	26.6	70.3	101.5	13.2	13.6	893.9	1,261.3
Avg.	112.6	57.9	21.4	22.4	87.3	95.6	15.7	12.8	1,114.2	1,302.5
Max.	125.3	156.3	42.2	85.5	114.1	327.5	18.7	22.0	1,537.0	
Min.	96.6	.4	9.2	0	63.2	10.0	13.2	0	790.4	

In Mexico

Month	BOQUILLA (Capacity 2,417.5)		LA COLINA (Capacity 19.5)		ROSETILLA (Capacity 15.4)		FRANCISCO I. MADERO (Capacity 344.6)		CENTENARIO and SAN MIGUEL (Capacity 19.9)	
	1959	#Average 1914-1959	1959	Average 1940-1959	1959	Average 1940-1959	1959	#Average 1948-1959	1959	Average 1934-1959
Jan.	2,107.3	1,371.2	18.2	17.9	13.4	13.3	335.0	180.4	18.4	12.1
Feb.	2,102.3	1,342.6	18.2	18.2	13.9	13.9	328.9	180.1	19.5	11.7
Mar.	2,062.9	1,295.3	18.4	17.8	12.3	13.1	317.1	175.5	15.0	8.7
Apr.	1,975.6	1,228.6	19.5	18.5	13.1	12.7	304.0	154.8	16.7	7.4
May	1,885.6	1,180.2	18.2	18.4	15.5	11.7	283.3	138.6	18.9	8.7
June	1,786.3	1,098.6	17.5	18.2	15.6	12.2	262.8	117.1	18.3	8.2
July	1,728.3	1,132.8	18.0	18.5	13.8	12.2	248.7	122.4	19.8	8.0
Aug.	1,997.8	1,293.9	15.8	18.0	15.6	12.7	356.6	146.1	19.1	8.4
Sept.	1,994.3	1,454.7	16.9	17.9	15.2	13.3	330.2	187.6	20.0	10.6
Oct.	1,975.7	1,462.4	17.8	18.1	14.2	13.2	315.0	193.2	19.9	12.5
Nov.	1,945.1	1,428.2	17.9	17.9	13.2	12.5	310.2	192.3	19.9	12.2
Dec.	1,940.4	1,402.5	18.1	17.7	14.3	13.5	308.8	191.5	19.7	12.0
Avg.	1,958.5	1,307.6	17.9	18.1	14.2	12.9	308.4	165.0	18.8	10.0
Max.	2,107.3	2,544.7	19.5	20.4	15.6	19.4	356.6	366.6	20.0	20.7
Min.	1,728.3	16.9	15.8	13.5	12.3	.4	248.7	1.4	15.0	0

Month	VENUSTIANO CARRANZA (Capacity 1,123.0)		MARTE R. GOMEZ (Capacity 1,019.1)		CULEBRON and VILLA CARDENAS (Capacity 90.0)		PALITO BLANCO (Capacity 124.0)		TOTAL IN MEXICAN RESERVOIRS (Capacity 5,173.0)	
	1959	Average 1930-1959	1959	#Average 1943-1959	1959	#Average 1939-1959	1959	Average 1942-1959	1959	Estimated Average
Jan.	1,140.3	357.4	1,032.8	528.4	48.4	41.0	89.7	44.4	4,803.5	2,566.1
Feb.	1,141.9	342.6	1,031.2	477.8	50.6	37.6	89.6	37.4	4,796.2	2,461.9
Mar.	1,078.2	322.4	1,014.2	432.9	50.9	32.7	80.7	38.2	4,649.8	2,336.6
Apr.	1,068.8	312.2	946.1	424.9	46.0	33.5	78.5	34.8	4,468.2	2,226.9
May	1,053.2	305.6	826.1	402.9	60.4	37.5	59.8	89.7	4,221.0	2,133.3
June	984.0	294.9	771.0	367.6	45.6	45.1	60.4	30.3	3,961.5	1,992.2
July	914.3	284.4	727.2	348.7	27.6	40.2	49.0	34.3	3,746.7	2,001.5
Aug.	904.4	287.1	694.8	427.3	23.7	40.2	36.7	32.9	4,064.7	2,266.6
Sept.	866.2	348.5	696.4	521.9	38.9	50.8	26.1	46.6	4,004.3	2,651.9
Oct.	876.1	380.5	685.0	571.1	29.6	56.9	40.7	57.3	3,974.0	2,765.2
Nov.	864.9	388.3	679.4	567.2	26.3	47.9	38.2	55.8	3,915.2	2,722.3
Dec.	844.3	388.1	667.2	566.3	34.0	52.6	35.1	53.2	3,881.9	2,697.4
Avg.	978.0	334.3	814.3	469.8	40.2	43.0	57.0	41.2	4,207.2	2,401.8
Max.	1,141.9	1,163.4	1,039.3	1,207.1	60.4	116.8	89.7	140.1	4,803.5	
Min.	844.3	*	1.0	667.2	17.8	23.7	0	26.1	0	3,746.7

* Some months missing * Minimum since full reservoir in 1932 ** Excludes Bluewater Reservoir † Minimum since full reservoir in 1947 § Daily extreme

STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN
International Falcón Reservoir

Falcón Dam is the lowermost of the major international storage dams authorized for construction on the Rio Grande by the Water Treaty of 1944 between the United States and Mexico and was the first dam constructed. It is located 84.5 river miles downstream from Laredo, Texas and Nuevo Laredo, Tamaulipas, 974.4 river miles below the American Dam, and 273.8 river miles above the Gulf of Mexico.

Maximum storage for period of record: 3,490,600 acre-feet on October 19, 1958.

Storage Capacities

(1956 SURVEY)

Elevation	Description	At Indicated Elevation		Between Indicated Elevations	
		Reservoir Capacity Acre-Feet	Reservoir Area Acres	Storage Volume Acre-Feet	Type of Storage
175.0	Original River Bed at Dam Axis	0	0		
203.33	Lowest Outlet (Mexican Penstock)	2,816	676	2,816	Silt and Dead
296.4	Top of Conservation Storage	2,371,221	78,342	2,368,405	Silt and Conservation
306.7	Top of Spillway Gates	3,280,683	98,959	909,462	Ordinary Flood
314.2	Maximum Water Surface	4,080,817	115,613	800,134	Super Flood

During the winter months, 400,000 acre-feet of the flood control capacity may be utilized for additional conservation storage.

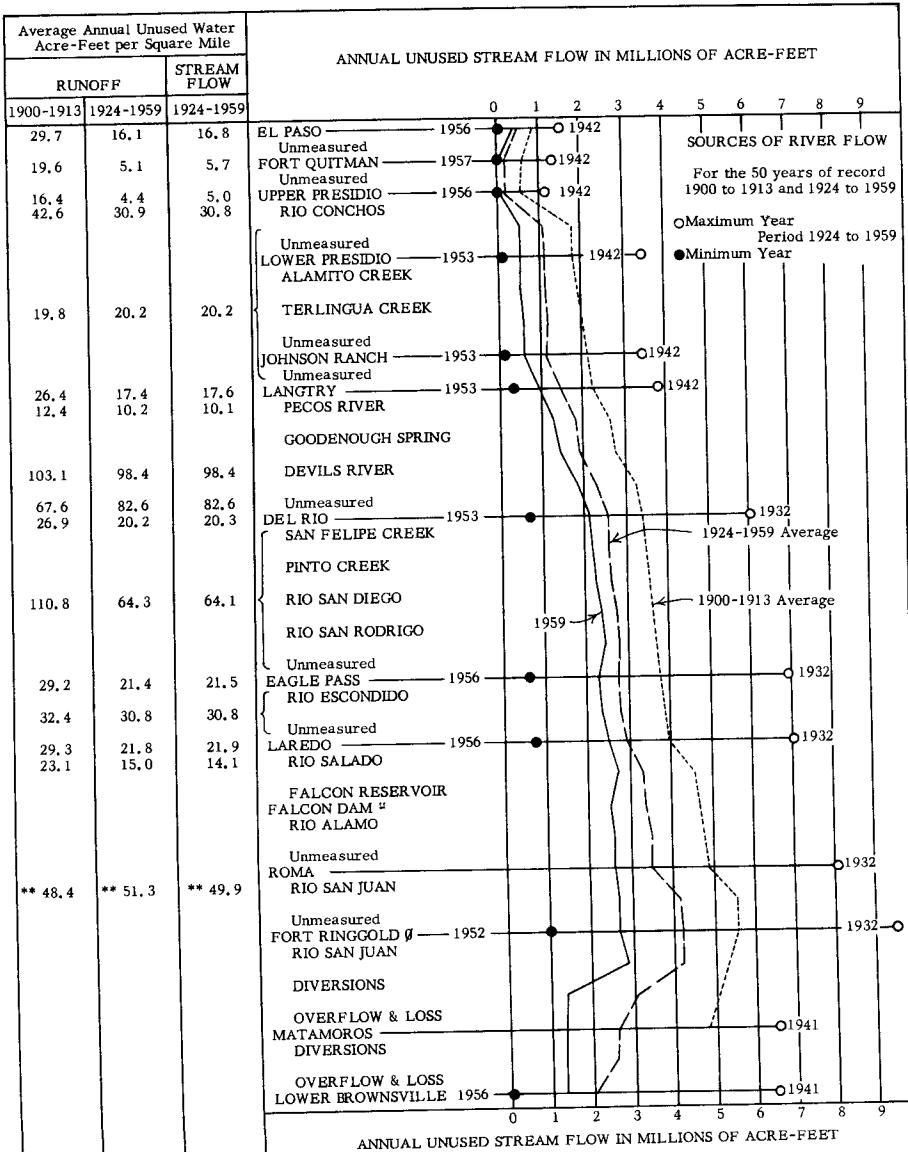
Storage in Thousands of Acre-Feet at 24:00 Hours—Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,884.1	2,900.7	2,799.8	2,597.3	2,515.0	2,316.8	2,289.1	2,313.7	2,321.4	2,282.2	2,542.0	2,620.6
2	2,854.8	2,896.2	2,795.4	2,593.1	2,513.4	2,309.1	2,285.3	2,315.3	2,324.5	2,275.4	2,546.9	2,622.3
3	2,866.5	2,900.7	2,790.1	2,593.1	2,509.3	2,295.3	2,283.8	2,316.8	2,329.2	2,279.2	2,551.8	2,624.0
4	2,873.7	2,901.6	2,784.0	2,584.0	2,510.1	2,286.1	2,281.5	2,316.8	2,329.9	2,308.3	2,560.2	2,625.6
5	2,886.3	2,901.6	2,780.5	2,580.7	2,512.6	2,276.9	2,276.9	2,316.8	2,329.2	2,328.4	2,561.7	2,625.6
6	2,895.3	2,896.2	2,774.4	2,575.7	2,507.7	2,283.0	2,273.1	2,317.6	2,330.7	2,361.1	2,562.5	2,626.5
7	2,901.6	2,891.7	2,769.1	2,569.9	2,505.2	2,279.2	2,267.8	2,317.6	2,340.0	2,410.6	2,564.2	2,626.3
8	2,908.9	2,884.5	2,764.8	2,569.9	2,500.4	2,277.7	2,264.7	2,318.3	2,345.5	2,431.3	2,566.6	2,629.8
9	2,913.4	2,882.7	2,750.9	2,565.8	2,490.6	2,276.1	2,257.9	2,319.1	2,348.6	2,440.8	2,566.6	2,632.3
10	2,926.2	2,877.3	2,751.7	2,565.0	2,487.4	2,269.3	2,251.1	2,319.9	2,356.4	2,448.0	2,566.6	2,633.2
11	2,937.1	2,870.1	2,744.8	2,564.2	2,482.6	2,257.9	2,243.5	2,319.9	2,355.6	2,450.4	2,569.9	2,634.9
12	2,945.4	2,864.2	2,736.1	2,564.2	2,473.7	2,245.8	2,236.0	2,319.1	2,354.0	2,453.6	2,572.4	2,634.9
13	2,950.9	2,862.0	2,728.4	2,559.2	2,464.8	2,235.2	2,232.9	2,316.8	2,353.2	2,464.8	2,578.2	2,635.7
14	2,951.8	2,859.3	2,722.3	2,556.7	2,455.2	2,227.7	2,226.9	2,312.9	2,351.7	2,468.9	2,579.8	2,636.5
15	2,957.3	2,854.8	2,716.5	2,555.9	2,443.2	2,221.7	2,223.9	2,310.6	2,349.4	2,474.5	2,582.3	2,638.2
16	2,948.1	2,852.1	2,706.9	2,553.4	2,429.7	2,222.4	2,218.7	2,309.9	2,345.5	2,485.8	2,587.3	2,638.2
17	2,946.3	2,852.1	2,696.6	2,551.8	2,414.6	2,223.9	2,212.7	2,306.0	2,341.6	2,493.1	2,589.8	2,639.9
18	2,940.8	2,851.3	2,686.3	2,551.0	2,400.3	2,223.9	2,206.7	2,302.2	2,336.9	2,491.5	2,592.3	2,639.1
19	2,940.8	2,851.3	2,676.2	2,549.3	2,386.9	2,217.1	2,206.7	2,299.9	2,333.0	2,494.7	2,593.1	2,636.5
20	2,938.1	2,851.3	2,672.8	2,547.7	2,383.8	2,217.9	2,214.2	2,297.6	2,329.2	2,496.3	2,598.9	2,635.7
21	2,934.4	2,846.8	2,664.3	2,547.7	2,375.1	2,213.4	2,221.7	2,293.7	2,323.7	2,498.7	2,602.3	2,634.9
22	2,931.7	2,838.8	2,653.4	2,542.0	2,368.1	2,209.0	2,248.0	2,290.7	2,318.3	2,502.0	2,604.8	2,634.9
23	2,926.2	2,832.5	2,643.3	2,539.5	2,361.8	2,203.7	2,274.6	2,287.6	2,312.2	2,506.2	2,607.3	2,632.3
24	2,925.3	2,829.0	2,634.9	2,537.9	2,358.7	2,203.0	2,290.7	2,293.7	2,306.8	2,508.5	2,609.8	2,627.3
25	2,920.7	2,825.4	2,633.2	2,535.4	2,352.5	2,225.4	2,299.1	2,302.9	2,302.2	2,510.1	2,610.6	2,624.0
26	2,918.9	2,820.1	2,626.5	2,532.9	2,349.4	2,233.7	2,301.4	2,309.1	2,299.1	2,512.6	2,611.2	2,620.6
27	2,915.3	2,812.2	2,622.3	2,531.3	2,346.2	2,278.4	2,302.9	2,312.9	2,294.5	2,515.0	2,612.3	2,618.1
28	2,910.7	2,807.7	2,617.3	2,529.7	2,342.4	2,291.4	2,303.7	2,316.8	2,293.7	2,518.3	2,612.3	2,615.6
29	2,905.3	2,809.9	2,613.9	2,526.4	2,339.2	2,293.7	2,303.7	2,319.9	2,293.0	2,519.9	2,613.1	2,609.8
30	2,900.7	2,808.9	2,520.7	2,333.8	2,293.0	2,308.3	2,321.4	2,287.6	2,525.6	2,618.1	2,605.6	
31	2,896.2	2,603.9		2,326.8		2,310.6	2,323.0		2,529.7		2,603.1	

Month	1959						Period 1953-1959		
	MOMENTARY MAXIMUM			MOMENTARY MINIMUM			Average	Storage	
	Elevation	Storage	Day	Elevation	Storage	Day		Average	Maximum
Jan.	303.35	2,960.1	15	302.05	2,842.3	1	2,916.5	1,352.8	2,916.5
Feb.	302.72	2,902.5	5	301.66	2,807.7	28	2,861.2	1,237.6	2,861.2
Mar.	301.66	2,807.7	1	299.28	2,603.9	31	2,702.4	1,161.5	2,702.4
Apr.	299.28	2,603.9	1	298.27	2,520.7	30	2,556.4	1,079.8	2,556.4
May	298.27	2,520.7	1	295.83	2,326.8	31	2,427.1	1,111.8	2,427.1
June	295.83	2,326.8	1	294.05	2,191.8	24	2,253.7	1,098.2	2,253.7
July	295.62	2,310.6	31	294.24	2,206.0	20	2,261.9	1,302.9	2,261.9
Aug.	295.78	2,323.0	31	295.30	2,286.1	23	2,310.9	1,318.0	2,310.9
Sept.	296.23	2,357.9	11	295.32	2,287.6	30	2,327.9	1,537.8	2,327.9
Oct.	298.38	2,529.7	31	295.15	2,274.6	2	2,451.1	1,801.2	3,250.2
Nov.	299.45	2,618.1	30	298.38	2,529.7	1	2,584.5	1,817.1	2,964.4
Dec.	299.74	2,642.4	18	299.27	2,603.1	31	2,627.8	1,791.7	2,904.7
Yearly	303.35	2,960.1		294.05	2,191.8		2,523.4	1,384.2	2,253.4

SOURCES OF RIVER FLOW

The graph and the column of figures on this page represent data on the annual yield of drainage areas tributary to various stream-gaging stations in the Rio Grande watershed. The graphic values are for the entire tributary area, while the column figures are reduced to the yield from one average square mile of the tributary area. There were no reservoirs of consequence on the area from 1900 to 1913; therefore, the figures in the first column correspond to those for that period in the graph. Because more than 10,000,000 acre-feet of reservoir capacity have been developed on the watershed since 1913, in which large volumes of unused runoff are stored in some years and released in later years as unused stream flow (thus reducing the unused stream flow in some years and adding thereto in others), it is significant to differentiate between the unused runoff and unused stream flow.



^a Values prior to 1953 considered the same as for Zapata gaging station. ^b Values prior to 1955 considered the same as for Rio Grande City gaging station. ** Includes contributions of the Rio San Juan entering the Rio Grande above and below Rio Grande City.

DIVERSIONS FROM THE RIO GRANDE AMERICAN CANAL AT EL PASO, TEXAS

DESCRIPTION: An open channel rating station in a concrete-lined canal with a water-stage recorder located 2,350 feet below the headgates at the American Dam near El Paso, Texas. Measurements are made at the downstream end of the first covered section of this Canal, 835 feet below the recorder. The zero of the gage is 3,712.09 feet above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 13 meter measurements during the year, a stable rating curve at medium and high flows, and a continuous record of gage heights. After May 7, 1954 computations for flows below gage height 2.80 feet (discharge approximately 30 second-feet) are based on auxiliary recorder 400 feet below headgates. Records available: June 2, 1938 through December 1959.

REMARKS: This canal diverts water from the Rio Grande at the American Dam near El Paso, Texas, 2.1 river miles above the International Dam near Juárez, Chihuahua. Water from this canal discharges into the Franklin Canal from which water is frequently returned to the Rio Grande at spillways 2.2, 2.7, and 3.6 river miles below the American Dam.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,840 second-feet on March 27, 1944. Min. frequently no flow.

Average Flow in Second-Feet

Daily:	Max. 1,510	Aug. 13, 1945	Min. 0	Frequently
Monthly:	Max. 1,210	Aug. 1943	Min. 0	Frequently since 1952
Yearly:	Max. 748	1943	Min. 65.3	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	76.2	58.7	55.8	577	677	722	1,010	775	531	171	101	101
2	77.7	59.2	56.3	600	905	701	890	770	490	171	99.7	97.1
3	78.4	60.4	54.6	463	850	794	880	782	636	176	97.1	101
4	77.0	60.4	88.6	497	724	741	794	729	678	166	93.0	105
5	73.4	58.1	59.8	634	678	790	954	741	887	157	96.2	101
6	74.1	56.9	596	621	619	804	763	827	1,160	154	94.6	96.2
7	74.1	54.6	640	588	508	800	647	832	1,060	154	101	98.8
8	72.1	58.1	586	619	443	794	598	938	853	148	105	102
9	70.0	61.7	659	565	463	767	636	1,000	734	146	101	103
10	69.4	59.2	926	490	450	685	748	1,050	615	146	101	108
11	71.4	61.7	895	506	492	674	861	1,010	688	143	102	107
12	28.4	59.8	806	557	450	651	853	848	553	137	104	103
13	1.0	61.7	1,080	503	428	706	777	697	551	138	107	105
14	1.0	61.7	1,220	492	399	861	777	853	526	137	102	107
15	1.0	59.8	1,120	510	461	1,050	797	831	499	138	102	108
16	1.0	61.7	978	454	506	1,040	741	971	596	134	101	110
17	1.0	61.7	1,243	322	586	830	856	863	533	131	97.1	107
18	1.0	59.2	1,230	330	642	760	780	767	381	131	98.8	105
19	1.0	58.7	1,220	315	569	718	892	751	310	130	105	104
20	1.0	56.3	991	283	583	711	916	767	283	130	107	108
21	1.0	60.4	988	265	484	755	940	992	276	123	105	109
22	1.0	62.9	910	219	433	770	814	725	266	122	108	112
23	1.0	59.8	910	198	426	790	672	722	233	125	104	113
24	1.0	60.4	884	230	418	760	692	518	224	119	101	116
25	1.0	60.4	791	350	470	729	724	575	211	120	101	120
26	1.0	59.8	466	477	429	908	850	598	205	114	104	119
27	1.0	59.2	586	581	461	1,070	940	566	195	108	99.7	107
28	1.0	56.9	708	590	483	1,090	900	907	189	107	101	106
29	1.0	681	590	625	1,170	802	427	185	110	102	105	
30	40.0		780	588	660	1,200	711	551	174	121	103	104
31	61.0		550		751		782	621		102		119
Sum	1,669.4	23,297.3	14,014	17,073	24,841	24,997	24,004	14,722	4,209	3,044,2	3,307.1	
	960.2											

Current Year 1959

Month	Extreme Gage			Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Period June 1938-1959		
	Extreme Gage Feet			High	Day	Low			Average	Maximum	Minimum
High	Low	Day	High	Day	Low						
Jan.	3.62		1	82.0	† 12	1.0	31.0	1,900	1,356	8,110	0
Feb.	3.41	3.15	† 11	67.4	20	51.4	59.6	3,310	6,398	19,500	0
Mar.	9.97	2.91	19	1,350	4	36.6	752	46,200	29,005	50,100	1,700
Apr.	7.82	4.39	2	734	24	155	467	27,800	40,187	70,900	4,560
May	8.82	5.95	2	994	14	368	551	33,900	33,700	69,000	517
June	10.52	7.30	3	1,550	12	617	828	49,300	41,407	65,700	5,990
July	9.38	6.45	3	1,160	3	452	806	49,600	48,371	70,700	8,950
Aug.	10.92	4.75	25	1,700	25	201	774	47,600	48,640	74,600	4,840
Sept.	9.49	4.50	6	1,200	30	168	491	29,200	33,110	63,100	2,230
Oct.	4.60	3.86	2	181	31	101	136	8,350	15,415	39,100	0
Nov.	3.96	3.68	16	110	4	86.6	101	6,040	8,713	21,000	0
Dec.	4.12	3.78	† 25	126	† 2	94.6	107	6,560	9,010	25,500	0
Yearly	10.92			1,700		1.0	428	309,760	315,312	541,610	47,397.4

† And other days

DIVERSIONS FROM THE RIO GRANDE
ACEQUIA MADRE NEAR JUAREZ, CHIHUAHUA

DESCRIPTION: Water-stage recorder and bridge for meter measurements located about 260 feet below the canal intake at the International Dam at Juárez, Chihuahua, which is 2.1 river miles below the American Dam at El Paso, Texas.

RECORDS: Based on 112 meter measurements during the year, 68 by the Mexican and 44 by the United States Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: 1938 through December 1959. These records, showing the water actually diverted by Mexico, do not necessarily reflect the quantities of water made available to Mexico in the bed of the river by the United States under terms of the Convention of 1906. Such quantities of water are included in the record of "Rio Grande below American Dam," see page 8 in this Water Bulletin.

REMARKS: In 1959, all of the 60,110 acre-feet tabulated below were distributed to land irrigated in the first unit under the canal.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 480 second-feet on July 21, 1944 with a gage height of 6.00 feet. Min. no flow through the winter months.

Average Flow in Second-Feet

Daily:	Max. 339	May 10, 1942	Min. 0	Several months each year
Monthly:	Max. 283	May 1938	Min. 0	Several months each year
Yearly:	Max. 116	1942	Min. 10.8	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	112	178	178	194	191	206	0	0	0
2	0	0	0	179	170	183	197	193	198	0	0	0
3	0	0	0	189	175	183	187	197	209	0	0	0
4	0	0	0	180	167	185	199	196	198	0	0	0
5	0	0	0	182	172	184	204	188	201	0	0	0
6	0	0	0	182	168	179	194	188	203	0	0	0
7	0	0	0	181	172	182	198	189	203	0	0	0
8	0	0	0	184	167	181	198	189	202	0	0	0
9	0	0	0	177	170	183	201	186	212	0	0	0
10	0	0	0	179	170	186	187	183	216	0	0	0
11	0	0	0	178	174	184	189	192	31.8	0	0	0
12	0	0	0	178	169	182	195	189	0	0	0	0
13	0	0	0	174	172	184	198	189	0	0	0	0
14	0	0	0	173	178	186	198	196	0	0	0	0
15	0	0	0	177	174	187	200	185	0	0	0	0
16	0	0	0	176	173	185	197	181	0	0	0	0
17	0	0	0	174	173	190	201	174	0	0	0	0
18	0	0	0	176	172	190	197	179	0	0	0	0
19	0	0	0	176	174	184	198	186	0	0	0	0
20	0	0	0	178	171	184	196	191	0	0	0	0
21	0	0	0	184	172	184	203	194	0	0	0	0
22	0	0	0	173	171	184	200	190	0	0	0	0
23	0	0	0	180	174	186	200	196	0	0	0	0
24	0	0	0	176	173	188	202	194	0	0	0	0
25	0	0	0	180	166	184	203	196	0	0	0	0
26	0	0	0	177	168	186	205	192	0	0	0	0
27	0	0	0	173	162	179	202	201	0	0	0	0
28	0	0	0	185	169	183	206	204	0	0	0	0
29	0	0	0	184	173	185	203	200	0	0	0	0
30	0	0	0	189	173	189	200	202	0	0	0	0
31	0	0	0		172		195	201	0	0	0	0
Sum	0	0	5,306		5,528		5,932		0	0		
				5,312		6,147		2,079.8		0		

Current Year 1959

Month	Average Rainfall Inches **		Extreme Second-Feet		Average Second- Feet	Total Acre-Feet	Acre-Feet		
	1938-1959	1959	Day	High	Low		Average	Maximum	Minimum
Jan.	.39	.11		0	0	0	0	0	0
Feb.	.29	T		0	0	0	0	0	0
Mar.	.28	.01		0	0	0	1,076	5,540	0
Apr.	.19	.05	3	198	1	177	10,520	6,222	11,700
May	.44	.39	1	200	27	Ø 162	10,540	10,346	17,400
June	.69	.56	30	199	† 6	Ø 179	184	10,970	8,576
July	1.52	.67	4	220	† 3	186	198	12,190	8,669
Aug.	1.42	1.56	27	216	22	125	191	11,770	8,548
Sept.	.95	.05	10	230	† 12	0	69.3	4,120	6,160
Oct.	.88	.70		0	0	0	0	70.2	12,380
Nov.	.25	.54		0	0	0	0	0	0
Dec.	.42	.17		0	0	0	0	0	0
Yearly	7.72	4.81		230		0	83.0	60,110	49,667.2
								83,930	7,864

† And other days Ø Mean daily ** Average for valley floor from El Paso to Island Station.

**DIVERSIONS FROM THE RIO GRANDE
MAVERICK CANAL AT MILE 13 NEAR QUEMADO, TEXAS**

DESCRIPTION: For power generation and irrigation use, water is diverted into the main Maverick Canal from the Rio Grande at a point 17.3 river miles below the international bridge between Del Rio, Texas and Cd. Acuña, Coahuila, and 710.8 river miles below the American Dam at El Paso, Texas. At a point 31.8 canal miles below the headworks of this canal, a portion of the diverted water returns to the river through the Maverick Power Plant and the remainder enters the Maverick Canal extension. The discharges shown below are based on the continuous record of a bubbler-type water-stage recorder, operated with bottled nitrogen gas, and measurements of discharge at a point approximately 13 canal miles below the diversion point. Gage heights at this station are often affected by gate operation at Las Moras Siphon, 2.4 miles downstream.

RECORDS: Based on 54 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: June 21, 1949 through December 1959.

REMARKS: In 1959 a total of 32,984 acres of land was irrigated from this canal and its extension. Of this total, 8,514 acres were between this point and the Power Plant and 24,470 acres were irrigated from the Maverick Canal extension. A total of 688,600 acre-feet of water returned to the Rio Grande at the power plant and some returned through the irrigation system.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 1,650 second-feet on May 27, 1952. Min. no flow several days in June, July and November 1954.

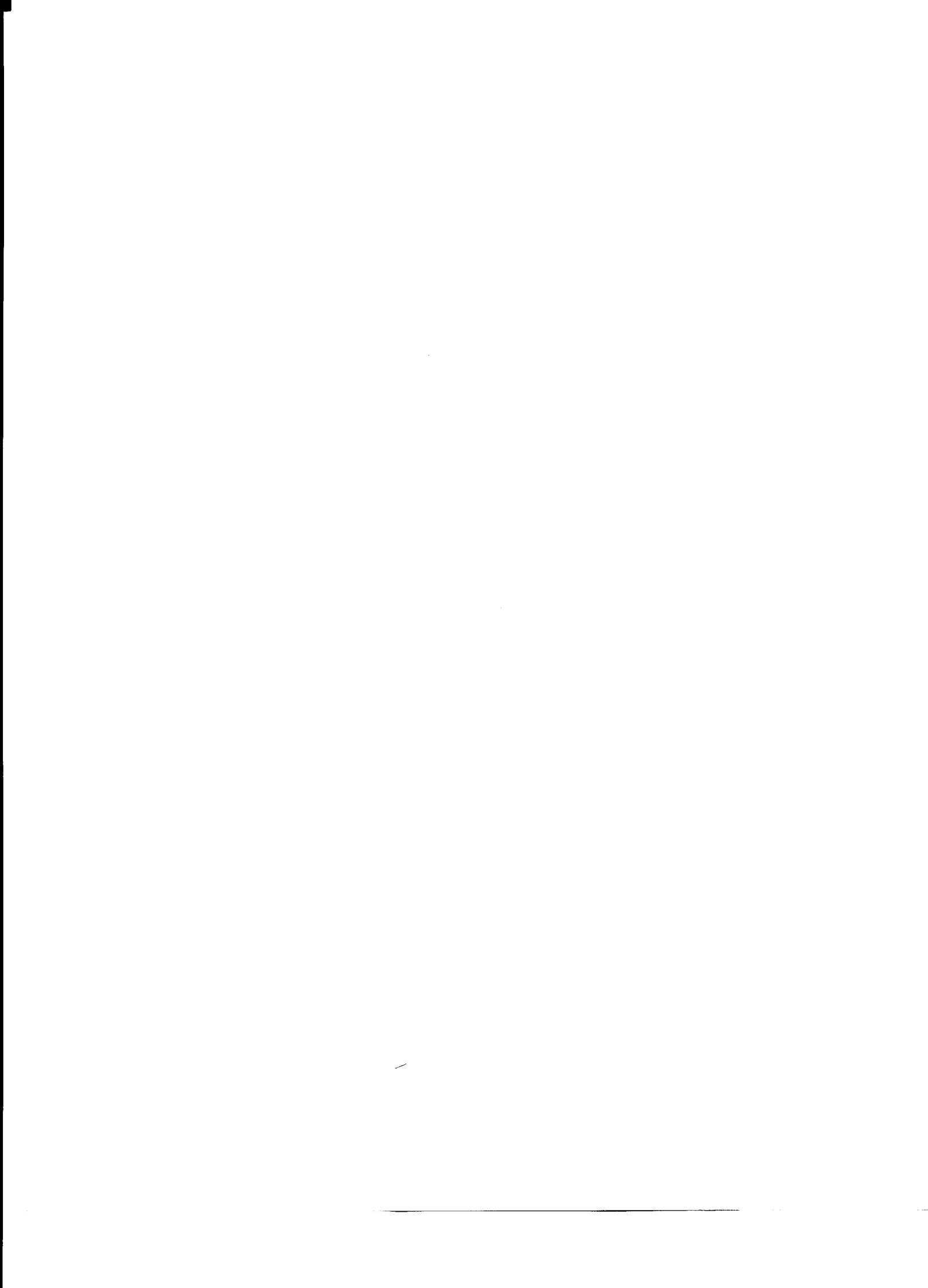
Average Flow in Second-Feet

Daily:	Max.	1,620	July 13, 1952	Min.	0	June 28 thru July 11 and Nov. 2, 1954
Monthly:	Max.	* 1,530	July 1952	Min.	319	July 1954
Yearly:	Max.	1,390	1950	Min.	914	1956

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,330	1,310	1,320	1,160	1,240	1,340	1,340	1,360	955	1,390	1,410	1,340
2	1,330	1,300	1,310	1,170	1,180	1,330	1,340	1,360	902	1,340	1,430	1,340
3	1,320	1,290	1,310	1,180	1,210	1,330	1,350	1,350	1,230	1,320	1,410	1,340
4	1,320	1,290	1,310	1,180	1,280	1,350	1,360	1,340	1,330	1,280	1,420	1,340
5	1,320	1,280	1,300	1,200	1,330	1,300	1,350	1,330	1,310	1,220	1,410	1,340
6	1,330	1,270	1,290	1,210	1,300	1,300	1,350	1,330	1,300	1,120	1,400	1,330
7	1,340	1,270	1,270	1,230	1,300	977	1,360	1,330	1,270	1,360	1,380	1,330
8	1,350	1,270	1,290	1,230	1,270	1,200	1,370	1,340	1,340	1,440	1,390	1,310
9	1,340	1,280	1,310	1,240	1,260	1,340	1,370	1,350	1,390	1,410	1,430	1,390
10	1,320	1,300	1,310	1,260	1,270	1,340	1,370	1,340	1,360	1,430	1,390	1,310
11	1,330	1,300	1,300	1,270	1,310	1,340	1,370	1,340	1,440	1,430	1,380	1,320
12	1,330	1,310	1,280	1,270	1,300	1,320	1,380	1,330	1,430	1,430	1,380	1,300
13	1,340	1,310	1,280	1,270	1,280	1,330	1,380	1,330	1,460	1,430	1,380	1,290
14	1,340	1,320	1,260	1,270	1,310	1,330	1,390	1,330	1,460	1,340	1,380	1,270
15	1,360	1,320	1,250	1,260	1,290	1,300	1,360	1,340	1,440	1,430	1,380	1,250
16	1,330	1,320	1,230	1,250	1,260	1,290	1,340	1,350	1,440	1,420	1,370	1,250
17	1,310	1,320	1,200	1,250	1,240	1,280	1,340	1,340	1,430	1,440	1,360	1,240
18	1,310	1,320	1,180	1,260	1,150	1,200	1,390	1,340	1,410	1,430	1,350	1,230
19	1,300	1,320	1,170	1,270	1,260	1,270	1,410	1,320	1,400	1,420	1,360	1,240
20	1,310	1,320	1,160	1,270	1,320	1,260	1,380	1,340	1,400	1,410	1,350	1,240
21	1,280	1,310	1,140	1,260	1,340	1,270	1,370	1,400	1,390	1,400	1,360	1,240
22	1,290	1,310	1,150	1,260	1,340	1,260	1,230	1,470	1,380	1,400	1,360	1,240
23	1,290	1,310	1,160	1,260	1,360	1,250	1,390	1,500	1,390	1,400	1,360	1,240
24	1,300	1,310	1,140	1,250	1,340	1,310	1,380	1,460	1,400	1,390	1,350	1,230
25	1,310	1,310	1,140	1,240	1,330	1,220	1,350	1,480	1,410	1,400	1,350	1,220
26	1,320	1,310	1,120	1,250	1,330	1,040	1,340	1,500	1,430	1,380	1,350	1,230
27	1,330	1,310	1,130	1,280	1,330	1,290	1,380	1,500	1,430	1,370	1,330	1,210
28	1,320	1,320	1,160	1,270	1,320	1,280	1,400	1,500	1,380	1,370	1,330	1,200
29	1,310		1,160	1,270	1,350	1,350	1,400	1,490	1,360	1,370	1,330	1,220
30	1,310		1,160	1,250	1,350	1,330	1,390	1,500	1,350	1,360	1,330	1,210
31	1,310		1,170		1,360		1,380	1,230		1,370		1,220
Sum	36,510		37,290		38,407		42,820		42,720		41,170	39,380
	40,930		37,960		40,110		42,310		40,637			
Month	Extreme Gage Feet			Extreme Second-Feet		Average Second-Feet	Total	Period			July 1949-1959	
	High	Low	Day	High	Low			Acre-Feet	Average	Maximum	Minimum	
	High	Low	Day	Day	Day	Acre-Feet	Average	Maximum	Minimum			
Jan.	4.56	4.24	15	1,360	21	1,270	81,200	72,800	89,500	61,900		
Feb.	4.52		16	1,330	† 6	1,270	1,300	72,400	64,580	82,500	52,700	
Mar.	4.44	3.46	† 1	1,320	26	1,110	1,220	75,300	68,370	90,700	52,000	
Apr.	4.33	3.54	28	1,290	1	1,140	1,240	74,000	61,880	81,000	* 45,400	
May	4.76	3.36	† 23	1,370	18	1,030	1,290	79,600	67,280	82,200	* 39,400	
June	4.70	2.03	29	1,360	7	793	1,280	76,200	68,440	86,800	34,400	
July	4.97	3.66	20	1,440	22	1,150	1,360	83,900	* 68,391	93,900	* 19,600	
Aug.	3.24	† 23	† 6	1,500	31	1,050	1,380	84,900	* 73,400	88,500	53,000	
Sept.	5.15	0	12	1,500	2	343	1,350	80,600	72,073	* 84,500	47,000	
Oct.	5.01	2.54	† 8	1,450	6	913	1,380	84,700	73,682	87,500	* 54,300	
Nov.	4.90	4.16	† 1	1,440	28	1,310	1,370	81,700	70,927	82,800	55,900	
Dec.	4.27	3.66	5	1,350	28	1,180	1,270	78,100	72,809	85,600	58,600	
Yearly	0	0	0	1,500		343	1,320	952,600	834,632	1,004,200	* 663,500	

^u Estimated * Partly estimated † And other days Ø Mean daily



**DIVERSIONS FROM THE RIO GRANDE
MAVERICK CANAL EXTENSION BELOW THE POWER PLANT
NEAR EAGLE PASS, TEXAS**

DESCRIPTION: The main Maverick Canal divides into two branches at a point about 31.8 canal miles below the point at which water from the Rio Grande is diverted. One branch leads to the Maverick Power Plant and back to the Rio Grande. The other branch forms this Maverick Canal Extension, which is used to transmit irrigation water. The water-stage recorder is located at a wooden pile bridge about 1 mile below the heading of this canal extension. Meter measurements are made from the bridge.

RECORDS: Based on 54 meter measurements during the year, 50 by the United States and 4 by the Mexican Section of this Commission, and a continuous record of gage heights. Computations by shifting channel methods. Records available: 1939 through December 1959.

REMARKS: Irrigation from this canal extension began in June 1938. In 1959, 24,470 acres of land north and south of Eagle Pass were irrigated. Some water from this canal extension returns to the river through the irrigation system which extends approximately 67 canal miles downstream.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 549 second-feet on June 28, 1956. Min. occasionally no flow.

Average Flow in Second-Feet

Daily:	Max. 522	June 28, 1956	Min. 0	Occasionally
Monthly:	Max. 448	July 1955	Min. " 18.7	Mar. 1939
Yearly:	Max. 321	1952 & 1956	Min. 62.1	1939

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	160	152	193	341	263	249	268	281	224	272	250	237
2	152	151	191	336	219	315	268	284	221	266	195	240
3	153	151	192	319	188	339	271	299	229	268	180	240
4	153	151	199	322	190	308	269	304	230	210	180	239
5	156	153	223	323	192	294	272	296	270	155	217	238
6	150	149	223	322	188	253	291	263	295	150	266	238
7	159	159	224	326	186	195	317	262	301	189	263	238
8	181	166	223	311	186	209	352	265	285	232	269	239
9	181	168	223	295	187	248	392	273	275	236	266	236
10	182	169	224	283	189	245	396	297	269	224	262	237
11	186	160	242	224	189	244	401	290	269	216	251	242
12	186	154	246	202	203	241	398	285	269	217	245	239
13	184	153	250	201	213	243	368	288	269	214	228	243
14	186	154	251	199	232	249	* 360	295	268	210	206	238
15	184	155	250	200	263	285	* 388	277	266	240	196	224
16	185	155	303	191	255	324	* 387	269	248	239	198	235
17	185	157	303	204	257	326	* 358	264	232	239	193	245
18	213	156	304	238	248	332	* 372	268	216	239	197	244
19	241	154	306	242	255	* 338	* 342	263	226	240	197	239
20	241	156	290	238	256	* 342	* 314	266	238	240	196	231
21	243	154	265	236	208	* 345	* 215	257	238	263	192	259
22	243	155	269	250	190	* 348	* 204	255	241	288	193	289
23	243	153	270	258	186	* 352	* 214	255	250	287	221	297
24	221	168	285	258	182	345	* 213	256	262	283	215	300
25	201	190	300	254	181	284	* 212	258	266	280	220	300
26	198	191	302	251	189	218	* 212	261	267	273	237	300
27	178	191	325	248	189	224	* 211	263	268	275	234	296
28	150	194	344	253	207	219	* 262	245	263	272	234	303
29	149		344	266	229	243	275	234	267	275	232	298
30	149		343	262	230	267	281	234	275	263	275	297
31	148		347		234			282	227		275	301
Sum	4,519		7,853		8,424	*	9,365	8,334		7,685	7,542	8,002
	5,741		8,254		6,584	*				7,685	6,668	

Current Year 1959

Month	Average Rainfall		Extreme Second-Feet		Average Second- Feet	Total Acre-Feet	Acre-Feet				
	Inches **		High				Acre-Feet	Average	Maximum		
	1939-1959	1959	Day	Day							
Jan.	.95	.25	22	253	29	144	185	11,400	11,540		
Feb.	.99	.63	28	196	7	143	161	8,960	10,429		
Mar.	.73	" 28	351	1	185	266	16,400	12,591	22,500		
Apr.	1.59	1.24	2	353	17	180	262	15,600	12,777		
May	3.19	3.44	1	286	25	172	212	13,100	11,066		
June	1.97	3.78	24	370	7	173	281	16,700	12,271		
July	1.29	3.47	11	413	22	204	* 302	18,600	14,065		
Aug.	2.27	1.27	10	311	30	194	269	16,500	27,100		
Sept.	2.78	.69	7	314	4	178	256	15,200	24,100		
Oct.	1.85	3.43	1	304	6	124	243	15,000	3,480		
Nov.	.67	1.10	1	296	22	151	222	13,200	12,135		
Dec.	.67	.40	28	319	20	151	258	15,900	12,750		
Yearly	18.95	19.70		413		124	244	176,560	145,517		
							*	233,300	44,950		

^a Estimated * Partly estimated † And other days # Mean daily ** On United States side from Maverick Power Plant to Cuervo Creek.

**DIVERSIONS FROM THE RIO GRANDE
UNITED STATES SIDE BELOW FALCON DAM**

The official records show that in 1959 there were in this area 773,014 irrigable acres, several towns, and many rural homes served Rio Grande water under the jurisdiction of the 93rd District Court of Texas through its Special Water Master. This jurisdiction began in June 1956.

The total diversion in 1959 was 1,069,800 acre-feet, most of which was made by pumping from the river. About 95% of the water diverted from the Rio Grande was determined by this Commission through continuous records of discharge at open channel rating stations and at deflection meter stations developed by this Commission. The records for the balance of the diversions were furnished by the Special Water Master. Drainage from more than 90% of this area does not return to the Rio Grande, but some of it is re-used in the area. More than one crop per year is often grown on parts of this land.

Diversion data pertaining to "Diversions from the Rio Grande - United States side Below Rio Grande City" covering the years 1922 through 1957 may be found in previous issues of these Water Bulletins. The area irrigated below Rio Grande City is about 98% of the total acreage irrigated on the United States side below Falcon Dam.

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	400	69.0	55.0	2,310	2,120	2,780	2,890	925	2,230	3,030	287	1,230
2	507	126	377	2,410	1,490	3,370	3,270	460	2,240	3,020	666	1,080
3	252	178	252	2,570	1,010	3,590	2,970	1,060	2,140	2,360	895	1,010
4	125	552	181	2,190	2,050	3,730	2,280	1,160	2,130	1,320	1,050	794
5	280	342	329	1,890	2,380	3,900	2,160	1,230	1,740	1,260	895	552
6	11.0	407	325	2,620	2,410	3,090	3,430	1,340	1,380	1,380	540	492
7	13.0	339	154	2,910	2,520	2,230	3,760	1,350	2,450	1,690	591	807
8	284	43.0	136	2,730	2,230	3,120	3,750	982	2,680	1,480	503	1,250
9	385	364	636	1,500	1,830	3,110	3,820	654	2,690	1,320	718	1,470
10	153	412	450	1,250	1,560	3,060	3,870	1,370	2,530	1,160	738	1,350
11	185	198	624	581	2,590	3,070	3,530	1,530	2,260	925	853	1,420
12	556	273	766	179	2,870	3,020	3,310	1,590	1,840	1,420	892	1,070
13	569	449	1,020	636	2,990	3,070	3,890	1,560	1,320	1,370	1,100	673
14	271	438	457	718	3,160	3,040	3,880	1,470	2,280	626	639	1,610
15	265	223	278	576	3,260	3,150	3,880	1,050	1,990	525	390	1,530
16	340	279	553	754	2,630	2,150	3,660	779	2,170	879	591	1,310
17	293	457	484	822	2,390	948	3,190	2,040	2,500	820	399	1,220
18	74.0	520	569	324	3,300	935	2,800	2,170	2,530	516	279	1,240
19	356	514	600	224	3,430	1,380	1,880	2,190	2,110	1,220	478	996
20	443	251	761	1,110	3,730	1,160	3,130	2,140	1,520	1,280	557	922
21	478	107	542	1,150	4,040	917	2,990	1,960	2,470	1,310	469	1,750
22	453	98.0	231	1,360	4,020	1,850	2,730	1,460	2,430	1,350	421	1,950
23	634	317	1,040	1,530	2,660	1,860	2,700	1,010	2,470	1,390	1,110	1,810
24	423	239	1,310	1,610	2,060	1,760	2,760	2,050	2,910	993	1,340	1,420
25	99.0	105	1,180	2,600	1,860	2,030	1,760	2,920	708	1,150	663	
26	485	81.0	1,170	817	2,860	1,670	1,350	1,400	2,480	1,450	720	997
27	809	290	988	1,350	2,890	1,180	2,310	1,620	1,850	828	1,340	1,210
28	692	90.0	727	1,550	3,030	1,100	2,130	1,550	2,830	398	1,120	2,720
29	309		605	1,860	3,060	2,020	2,080	1,190	2,820	576	525	2,980
30	494		1,880	2,050	2,530	2,250	1,680	462	2,900	488	1,080	2,840
31	201		2,120		2,230		1,400	1,940		620		2,240
Sum	7,761.0		42,761		70,370		43,452		37,712		42,606	
10,839.0	20,800.0		81,930		89,510		68,810		22,336			

Current Year 1959												Period 1958-1959		
Month	Average Rainfall Inches **		Extreme Second-Feet		Average Second- Foot	Total Acre-Feet	Acre-Feet							
	1922-1959	1959	Day	High			Day	High	Low	Day	High	Average	Maximum	Minimum
Jan.	1.42	1.99	27	809	6	11.0	350	21,500	23,950	277	26,400	21,500		
Feb.	1.16	2.54	4	552	8	43.0	277	15,400	15,650	15,400	15,900	15,400		
Mar.	1.09	.33	31	2,120	1	55.0	671	41,300	28,550	41,300	41,300	41,300		
Apr.	1.38	1.52	7	2,910	12	179	1,430	84,800	99,400	114,000	84,800			
May	3.02	1.18	21	4,040	3	1,010	2,640	163,000	147,000	163,000	131,000			
June	2.62	2.95	5	3,900	21	917	2,350	140,000	173,000	206,000	140,000			
July	1.72	1.04	13	3,890	26	1,350	2,890	178,000	125,900	178,000	73,800			
Aug.	2.08	1.15	19	2,190	2	460	1,400	86,200	99,600	113,000	86,200			
Sept.	4.28	.60	25	2,920	13	1,320	2,290	136,000	92,800	136,000	136,000			
Oct.	2.53	3.65	1	3,030	28	398	1,220	74,800	51,300	74,800	27,800			
Nov.	1.27	2.10	† 24	1,340	18	279	745	44,300	39,350	44,300	34,400			
Dec.	1.41	.40	29	2,980	6	492	1,370	84,500	67,150	84,500	49,800			
Yearly	23.98	19.45		4,040		11.0	1,480	1,069,800	963,650	1,069,800	857,500			

† And other days § Mean daily ** United States side below Rio Grande City

DIVERSIONS FROM THE RIO GRANDE

ANZALDUAS CANAL NEAR REYNOSA, TAMAULIPAS

DESCRIPTION: Water-stage recorder and cable with stand-up cable car, located .5 mile below the canal intake. The zero of the gage is 86.32 feet above mean sea level, U. S. C. & G. S. datum. This canal diverts water from the Rio Grande at a point 12.7 river miles above the international bridge between Hidalgo, Texas and Reynosa, Tamaulipas, 1,076.6 river miles below the American Dam at El Paso, Texas and 171.6 river miles upstream from the Gulf of Mexico.

RECORDS: Discharges in 1959 were computed by taking the sum of the flows measured at Puente Monterrey 5.2 canal miles downstream and the return flow at Poniente Drain Station. Records available: 1952 through December 1959.

REMARKS: Diversions by this canal is for irrigation and domestic use in Mexico and for conveying water for storage in Culebrón Villa Cárdenas, and Palito Blanco reservoirs about 23 canal miles below this station. During 1959, 478,340 acres were irrigated with water delivered through this canal. Flow at this canal station is affected by backwater from the operation of canal gates 4.5 miles, 11.3 miles, and 22.5 miles below this station. During 1959, in order to facilitate construction of Anzalduas Dam, major portions of the Rio Grande flow were temporarily diverted into this canal and returned to the river through Poniente Drain. (See page 46.)

EXTREME FLOWS FROM RECORDS: Momentary: Max., 10,950 second-feet on June 2, 1957, with a gage height of 16.01 feet. Zero flow occurs frequently.

Average Flow in Second-Feet

Daily:	Max.	9,350		May 29, 1957		Min.	0	Frequently
Monthly:	Max.	4,260		Feb., 1956		Min.	0	Several months
Yearly:	Max.	1,980		1959		Min.	150	1952

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,590	2,390	2,400	2,500	1,690	2,650	2,150	2,310	3,810	1,650	0	0
2	2,320	2,390	2,400	2,510	1,810	2,650	2,090	893	4,130	1,300	0	0
3	2,150	2,390	2,400	2,490	1,190	2,780	2,110	876	4,410	601	0	0
4	2,080	2,390	2,400	2,510	1,160	3,100	2,020	876	4,310	742	0	0
5	2,010	2,400	2,400	2,520	1,680	3,600	2,390	876	4,380	813	0	0
6	2,030	2,450	2,400	2,510	1,670	4,980	2,590	876	4,240	672	0	0
7	2,090	2,060	2,400	2,510	1,760	5,120	2,660	876	4,130	495	0	0
8	2,140	2,480	2,400	2,520	1,770	4,730	2,800	876	4,200	275	0	0
9	2,130	2,390	2,400	2,510	2,040	4,100	2,780	876	4,200	31.4	0	0
10	2,100	2,390	2,400	2,510	3,600	4,100	3,350	957	4,380	25.4	0	0
11	2,040	2,390	2,400	2,610	4,030	4,100	3,710	999	4,380	25.4	0	0
12	2,020	2,390	2,400	2,920	4,200	4,310	3,570	886	3,960	25.4	0	0
13	1,960	2,390	2,390	2,930	4,380	5,650	3,600	1,040	2,980	25.4	0	0
14	1,950	2,390	2,400	2,930	4,630	5,970	3,710	1,140	2,070	25.4	0	0
15	2,330	2,390	2,400	2,930	4,450	5,330	3,330	1,650	1,790	1,110	0	0
16	2,830	2,390	2,400	2,930	4,930	4,060	2,550	2,080	1,790	940	0	0
17	2,940	2,390	2,400	2,930	5,860	2,790	2,650	1,920	1,790	265	0	96.4
18	2,380	2,390	2,400	2,930	6,750	2,400	3,210	1,790	1,790	144	0	545
19	2,080	2,400	2,400	2,940	6,690	925	3,670	1,740	1,790	192	0	812
20	2,380	2,400	2,400	3,030	6,690	217	3,410	1,920	1,790	68.9	0	2,060
21	2,390	2,400	2,400	2,410	6,060	143	2,330	1,810	1,810	25.4	0	2,090
22	2,380	2,400	2,400	1,830	5,340	99.2	1,720	2,280	1,810	17.7	0	2,240
23	2,390	2,400	2,400	2,180	5,160	181	2,480	2,600	1,810	17.7	0	2,700
24	1,920	2,400	2,400	1,560	5,160	177	2,840	3,240	1,810	14.1	0	2,360
25	2,380	2,400	2,400	776	4,700	230	2,400	4,030	1,810	14.1	0	1,920
26	2,390	2,400	2,400	1,130	3,530	247	1,670	4,310	1,810	10.6	0	950
27	2,390	2,400	2,400	1,160	3,070	265	1,770	3,230	1,650	7.1	0	982
28	2,390	2,400	2,400	1,110	2,900	212	1,680	1,500	1,620	.7	0	978
29	2,390	2,400	2,400	1,160	2,590	823	1,880	1,550	1,570	.4	0	978
30	2,290	2,400	2,400	1,150	2,090	2,210	2,400	2,840	1,550	.4	0	978
31	2,390	2,440			2,100		2,390	3,330		.4		978
Sum	66,490	68,636		78,149.2		56,177		9,534.9		20,667.4		
	70,250	74,430		113,680		81,910		83,570		0		

Month	Current Year 1959			Period 1952-1959				
	Average Rainfall Inches **		Ø Extreme Second-Feet	Average Second- Feet	Total Acres-Foots	Acre-Feet		
	1952-1959	1959	Day	Day	Acres-Foots	Average	Maximum	Minimum
Jan.	.89	1.96	17	2,940	24	1,920	2,270	139,300
Feb.	1.74	2.59	8	2,480	5	2,040	2,370	131,900
Mar.	.61	.35	31	2,440	13	2,390	2,400	147,600
Apr.	1.60	1.24	20	3,030	25	776	2,290	136,200
May	1.27	.95	18	6,750	4	1,160	3,670	225,400
June	2.38	3.38	14	5,970	22	99.2	2,600	155,000
July	1.35	1.71	11	3,710	26	1,670	2,640	162,400
Aug.	1.56	1.12	26	4,310	↑ 3	876	1,810	111,400
Sept.	3.15	.28	3	4,410	30	1,550	2,790	165,800
Oct.	3.29	3.43	1	1,650	↑ 29	.4	308	18,930
Nov.	1.56	2.05	0	0	0	0	0	90,356
Dec.	.59	.33	23	2,700	↑ 1	0	667	40,990
Yearly	19.99	19.39		6,750		0	1,980	1,434,920
							923,044	1,434,920
								109,282

Ø Mean daily ** Average of several stations ↑ And other days

DIVERSIONS FROM THE RIO GRANDE
RETAMAL CANAL NEAR RIO BRAVO, TAMAULIPAS

DESCRIPTION: Water-stage recorder and cable with cable car, located .9 mile below the canal headgate which is about 1,000 feet from the Rio Grande. Retamal Canal diverts from the Rio Grande at a point 1,114.7 river miles below the American Dam at El Paso, Texas, 25.4 river miles below the Hidalgo-Reynosa international highway bridge, and 133.5 river miles above the Gulf of Mexico. The zero of the gage is .85 foot above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 7 meter measurements during the year and a continuous record of gage heights. Computations by shifting channel methods. Records available: September 1939 through December 1959.

REMARKS: Retamal Canal empties into Culebrón and Villa Cárdenas reservoirs from which a canal leads to Palito Blanco No. 1 and No. 2 reservoirs. These reservoirs are used for irrigation purposes. Since 1953 irrigation water has been routed to these reservoirs by means of the Anzaldías Canal through Culebrón Lateral which empties into Retamal Canal 600 feet below its headgate. Flood flows diverted from the Rio Grande through Retamal Headgate may be routed to the Gulf of Mexico through Floodway No. 1 by means of Villa Cárdenas reservoir flood gates. In 1959 no flood flows were diverted through Retamal Canal. Except for the period April 7 through 29, 1959 when actual irrigation diversions took place, the figures shown below represent gate leakage.

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	35.3	70.6	70.6	67.1	0	0	0	0	0	0	0	0
2	35.3	70.6	70.6	67.1	0	0	0	0	0	0	0	0
3	35.3	70.6	70.6	67.1	0	0	0	0	0	0	0	0
4	35.3	70.6	70.6	67.1	0	0	0	0	0	0	0	0
5	35.3	70.6	70.6	67.1	0	0	0	0	0	0	0	0
6	35.3	70.6	70.6	67.1	0	0	0	0	0	0	0	0
7	35.3	70.6	70.6	136	0	0	0	0	0	0	0	0
8	35.3	70.6	70.6	174	0	0	0	0	0	0	0	0
9	35.3	70.6	70.6	185	0	0	0	0	0	0	0	0
10	35.3	70.6	70.6	177	0	0	0	0	0	0	0	0
11	35.3	70.6	67.1	162	0	0	0	0	0	0	0	0
12	35.3	70.6	67.1	189	0	0	0	0	0	0	0	0
13	35.3	70.6	67.1	218	0	0	0	0	0	0	0	0
14	35.3	70.6	67.1	202	0	0	0	0	0	0	0	0
15	35.3	70.6	67.1	194	0	0	0	0	0	0	0	0
16	35.3	70.6	67.1	194	0	0	0	0	0	0	0	0
17	53.0	70.6	67.1	202	0	0	0	0	0	0	0	0
18	53.0	70.6	67.1	186	0	0	0	0	0	0	0	0
19	53.0	70.6	67.1	194	0	0	0	0	0	0	0	0
20	53.0	70.6	67.1	199	0	0	0	0	0	0	0	0
21	53.0	70.6	67.1	136	0	0	0	0	0	0	0	0
22	53.0	70.6	67.1	65.7	0	0	0	0	0	0	0	0
23	53.0	70.6	67.1	69.2	0	0	0	0	0	0	0	0
24	70.6	70.6	67.1	72.4	0	0	0	0	0	0	0	0
25	70.6	70.6	67.1	78.4	0	0	0	0	0	0	0	0
26	70.6	70.6	67.1	88.3	0	0	0	0	0	0	0	0
27	70.6	70.6	67.1	93.9	0	0	0	0	0	0	0	0
28	70.6	70.6	67.1	65.3	0	0	0	0	0	0	0	0
29	70.6	70.6	67.1	36.0	0	0	0	0	0	0	0	0
30	70.6	70.6	67.1	7.1	0	0	0	0	0	0	0	0
31	70.6	70.6	67.1	0	0	0	0	0	0	0	0	0
Sum	1,976.8		3,726.9		0		0		0		0	
	1,500.6		2,115.1		0		0		0		0	

Current Year 1959

Month	Average Rainfall		Extreme Second-Feet		Average	Total	Acre-Feet		
	Inches **	Day	High	Low			Day	Acre-Feet	Average
1940-1959	1959	Day	High	Low	Day	Acre-Feet			
Jan.	1.30	2.15	†24	70.6	† 1	35.3	48.3	2,980	
Feb.	1.31	2.22	† 1	70.6	† 1	70.6	30.6	3,920	
Mar.	1.02	.35	† 1	70.6	† 11	67.1	68.2	4,200	
Apr.	1.34	1.25	†12	218	30	0	124	7,390	
May	2.65	1.42	0	0	0	0	0	0	
June	2.57	3.29	0	0	0	0	0	0	
July	1.26	1.87	0	0	0	0	0	0	
Aug.	2.35	.86	0	0	0	0	0	0	
Sept.	3.70	.27	0	0	0	0	0	0	
Oct.	3.06	2.73	0	0	0	0	0	0	
Nov.	1.18	2.08	0	0	0	0	0	0	
Dec.	1.01	.36	0	0	0	0	0	0	
Yearly	22.75	18.85		218	0	25.5	18,490		

† And other days ** Mean rainfall Reynosa to Matamoros

MUNICIPAL WATER USES

In Acre-Feet

Tabulated below are yearly and monthly amounts of water pumped from the Rio Grande, or tributaries, into the municipal distribution systems of several cities along the border. The basic data are furnished by the municipalities, April through August 1959, the City of El Paso pumped water from wells near Canutillo, Texas into the Rio Grande about 17 miles upstream from the point of diversion at the water plant. This water amounted to 2,268 acre-feet and is included in the figures below. The Del Rio water came from San Felipe Springs. All other diversions are from the Rio Grande. Because of changing conditions, the period records are limited here to the past 10 years.

The population figures for Mexico are estimates furnished by the Mexican Section of the International Boundary and Water Commission. Population data for United States cities are "preliminary" 1960 official census figures, except for Falcon Village, which was estimated by the International Boundary and Water Commission.

Records of Rio Grande water used by the city of Brownsville, as well as other municipalities in the Lower Rio Grande Valley in the United States side, are omitted because these amounts are included in the figures shown under "Diversions from the Rio Grande - United States Side Below Falcon Dam" on page 61 herein. The municipal water supply of Reynosa, Tamaulipas, Mexico is from the Rio Grande and Rhode Canal of the Marte R. Gómez Reservoir. Only the amounts diverted from the Rio Grande are shown below. The municipal water supply of Matamoros, Tamaulipas, Mexico is from the Rio Grande and Soliseno Canal of Culebra Reservoir. The Soliseno Canal water spills to the Rio Grande a short distance above the Matamoros water plant intake where it is diverted for municipal uses. The figures shown below do not include the water from Soliseno Canal.

Month	EL PASO			DEL RIO				
	1959	Period 1950-1959			1959	Period 1950-1959		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	0	328.6	963.2	0	240.5	203.3	240.5	148.9
Feb.	0	237.0	843.0	0	236.2	219.3	283.9	156.5
Mar.	374	238.7	1,016.2	0	382.2	295.6	467.4	185.2
Apr.	1,006	532.9	1,016.5	0	324.3	313.4	441.6	218.1
May	1,269	620.5	1,269.0	0	372.0	348.1	555.1	251.3
June	1,483	862.9	1,483.0	57.0	482.9	428.7	652.7	268.5
July	1,312	904.7	1,312.0	4.4	464.2	497.0	682.7	300.6
Aug.	1,470	1,001.5	1,470.0	0	598.8	515.4	691.7	271.9
Sept.	1,709	895.1	1,709.0	0	533.9	380.0	533.9	218.7
Oct.	419	591.4	983.0	0	332.2	273.8	387.5	189.0
Nov.	0	284.8	842.7	0	273.0	224.6	289.7	156.0
Dec.	0	291.3	952.8	0	260.1	218.6	266.1	160.7
Yearly	9,042	6,789.4	11,384.6	1,058.4	4,500.3	3,917.8	5,368.4	2,680.8

Month	EAGLE PASS			LAREDO				
	1959	Period 1950-1959			1959	Period 1950-1959		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	102.2	82.7	102.2	61.3	491.7	440.7	517.4	369.2
Feb.	101.2	80.2	101.2	52.1	393.7	430.2	523.0	352.0
Mar.	133.9	100.4	133.9	67.5	598.6	556.1	655.3	449.9
Apr.	114.3	102.9	117.8	75.7	644.8	609.7	734.0	502.3
May	146.9	115.8	148.4	70.2	880.7	670.0	880.7	514.7
June	166.8	133.6	173.4	86.8	913.5	720.0	913.5	541.9
July	173.1	157.2	217.4	103.7	939.1	826.1	1,098.1	591.7
Aug.	178.8	150.3	225.0	91.4	930.5	840.4	1,063.0	705.7
Sept.	166.7	121.4	166.7	74.9	940.3	661.2	940.3	533.1
Oct.	127.3	101.4	127.3	81.1	730.2	582.3	730.2	472.4
Nov.	100.3	83.7	100.3	66.8	575.0	476.2	578.8	398.1
Dec.	112.8	86.5	112.8	59.9	616.2	467.0	616.2	371.1
Yearly	1,624.3	1,316.1	1,624.5	899.0	8,654.3	7,279.9	8,654.3	6,184.2

Month	NEW ZAPATA			FALCON VILLAGE				
	1959	Period 1954-1959			1959	Period 1952-1959		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	18.7	13.1	18.7	5.0	3.7	4.0	7.2	2.1
Feb.	14.9	12.0	14.9	7.6	3.0	3.9	7.1	2.6
Mar.	25.1	17.6	25.1	10.2	5.3	6.0	10.4	3.5
Apr.	41.8	21.8	41.8	10.5	7.5	6.2	7.8	4.3
May	33.6	22.6	33.6	11.4	10.0	6.4	10.0	3.4
June	29.6	21.8	29.6	13.5	7.5	6.8	10.0	4.5
July	34.1	27.3	34.8	14.7	11.4	8.8	11.7	6.5
Aug.	32.4	27.0	37.9	15.8	10.7	8.6	10.7	6.5
Sept.	31.0	18.9	31.0	8.9	9.7	6.2	9.7	2.1
Oct.	26.4	18.4	26.4	13.0	8.7	5.8	8.7	3.1
Nov.	20.7	17.0	26.1	9.4	5.7	3.9	6.3	2.5
Dec.	20.4	16.3	23.0	9.1	7.8	4.2	7.8	2.6
Yearly	328.7	233.8	328.7	140.4	91.0	70.8	91.1	51.9

§ Includes Laughlin Air Force Base

MUNICIPAL WATER USES**In Acre-Feet****In the United States**

Month	ROMA (Pop. 9,400) *			RIO GRANDE CITY (Pop. 5,800)				
	1959	Period 1950-1959			1959	Period 1950-1959		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	23.8	16.1	23.8	9.4	40.8	43.0	54.2	35.1
Feb.	20.6	15.8	20.6	9.9	35.6	42.5	56.5	33.1
Mar.	26.8	19.5	26.8	13.0	46.9	48.4	63.3	35.0
Apr.	28.6	20.4	28.6	10.4	50.7	52.4	60.8	38.7
May	33.7	22.6	33.7	16.1	76.0	60.0	76.0	40.6
June	32.1	23.1	32.1	16.6	69.8	60.1	78.0	41.6
July	42.8	25.3	42.8	16.8	91.2	69.0	91.2	51.9
Aug.	41.9	24.9	41.9	17.4	82.0	68.6	82.0	50.1
Sept.	37.3	21.6	37.3	14.5	63.5	53.7	69.6	28.4
Oct.	37.5	20.8	37.5	13.7	58.2	50.0	62.1	30.3
Nov.	31.8	18.4	31.8	11.9	54.1	45.5	54.1	30.6
Dec.	33.8	18.6	33.8	12.0	62.3	47.0	67.9	36.5
Yearly	** 390.7	247.1	390.7	165.0	731.1	640.2	731.1	488.4

In Mexico

Month	NUEVO LAREDO (Pop. 92,994)			NUEVA CD. GUERRERO (Pop. 2,833)				
	1959	Period 1950-1959			1959	Period 1954-1959		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	586.4	432.7	586.4	269.2	31.9	29.0	32.8	20.2
Feb.	497.5	401.4	564.9	252.8	31.1	26.4	31.1	18.4
Mar.	619.7	496.1	665.6	339.9	32.9	30.1	32.9	21.2
Apr.	687.2	535.6	688.9	362.0	34.6	31.3	34.6	22.3
May	960.8	579.9	960.8	386.3	39.4	34.2	39.4	26.8
June	973.0	618.4	973.0	395.5	37.9	34.3	39.9	28.1
July	1,053.8	631.7	1,053.8	425.5	39.1	36.6	41.8	31.1
Aug.	1,031.8	648.1	1,031.8	440.5	38.3	36.2	39.2	31.5
Sept.	999.6	574.9	999.6	408.0	34.5	32.8	36.5	28.7
Oct.	877.3	556.3	877.3	375.0	35.9	33.1	35.9	29.3
Nov.	643.1	485.0	643.1	355.6	31.5	31.8	34.5	28.8
Dec.	694.8	460.0	694.8	339.1	33.4	31.8	33.4	28.9
Yearly	9,625.0	6,420.1	9,625.0	4,349.4	420.5	387.6	420.5	315.3

Month	REYNOSA (Pop. 72,259)			MATAMOROS (Pop. 92,702)				
	1959	Period 1954-1959			1959	Period 1950-1959		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	15.4	52.7	65.7	15.4	364.3	252.7	364.3	121.8
Feb.	14.6	54.2	68.1	14.6	326.1	232.8	329.2	112.0
Mar.	16.2	56.4	71.3	16.2	389.1	277.0	389.1	122.3
Apr.	16.6	57.3	73.0	16.6	434.0	267.1	434.0	118.0
May	16.7	59.4	76.2	16.7	459.3	283.1	459.3	126.6
June	0	56.9	76.2	0	451.2	289.1	451.2	123.6
July	0	57.4	76.2	0	472.8	294.3	472.8	124.3
Aug.	0	57.5	76.2	0	472.6	218.2	472.6	38.7
Sept.	0	54.9	74.6	0	456.0	274.4	456.0	130.8
Oct.	0	41.2	68.1	0	454.1	300.5	454.1	131.7
Nov.	0	40.3	67.3	0	339.2	276.6	368.3	124.4
Dec.	0	39.5	66.5	0	286.2	273.0	406.1	127.5
Yearly	79.5	627.7	859.4	79.5	4,904.9	3,238.8	4,904.9	1,494.5

* Includes Los Saenz and Escobares, Texas and Cd. Miguel Alemán, Tamaulipas. ** Includes 157 acre-feet supplied to Cd. Miguel Alemán, Tamaulipas.

SUSPENDED SILT IN THE RIO GRANDE AND TRIBUTARIES

The following tables are based on determinations of gravimetric percentages of dry silt in water samples taken at each station by one of the following three methods:

A. By lowering an open small-necked bottle in one or more verticals in the stream cross-section, being careful to approach but not strike bottom, thus securing an integrated sample throughout the depth. By taking from each sample an amount of water volumetrically proportional to the river flow represented by that sample, a composite, representative of the monthly river flow, is made and its gravimetric percentage of silt determined.

B. By sampling at the stream surface with a separate bottle at each of three points, spaced 1/6, 1/2 and 5/6 of the stream width. The gravimetric percentage in each sample is determined, a coefficient of 1.10 is applied to the average of the three, and the product applied to the volume of stream flow represented by that set of samples.

C. By sampling, at 8 hour intervals, the water pumped directly from the river to the Laredo, Texas Water Treatment Plant. From daily composites of these samples, a monthly composite, representative of the river flow, is made as stated in Method A and its gravimetric percentage of silt determined.

For ease of comparison, the assumption is made that one cubic foot of silt weighs 66.7 pounds, or one acre-foot of silt weighs 1,452 tons.

Month	1959						Period of Record		
	Tons		No. of Samples	Gravimetric Percentages			Acre-Feet at 1,452 Tons Per Acre Foot	Average	Maximum
	Water	Silt		Average	Maximum Sample	Minimum Sample			

Rio Grande at El Paso, Texas

Period September 1947-1959

Jan.	5,452,000	436	31	.008000			.30	.25	1.4	0
Feb.	4,543,000	402	17	.008855			.28	.35	2.2	.01
Mar.	68,920,000	63,300	26	.09190			43.6	18.4	50.3	.89
Apr.	52,539,000	13,300	30	.02527			9.2	16.5	45.2	3.4
May	60,812,000	19,700	31	.03244			13.6	12.6	63.3	.08
June	82,776,000	30,800	30	.03721			21.2	28.3	152	3.7
July	84,520,000	40,100	31	.04749			27.6	40.8	124	1.1
Aug.	90,235,000	124,000	31	.13700			85.4	46.8	112	3.7
Sept.	45,867,000	28,500	28	.06206			19.6	29.9	123	1.7
Oct.	11,513,000	968	31	.008410			.67	8.4	51.0	.01
Nov.	8,318,000	'693	30	.008327			.48	.40	1.5	.01
Dec.	8,928,000	1,010	29	.01136			.70	.36	2.1	.01
Yearly	524,423,000	323,209	345	.06163			222.63	203.06	436.87	47.67

Samples and Analyses by U. S. Section, Method A

Rio Conchos near Ojinaga, Chihuahua

Period 1956-1959

Jan.	50,197,000	0	14	0	0	0	0	0	0	0
Feb.	25,870,000	0	13	0	0	0	0	1.1	4.5	0
Mar.	25,889,000	0	14	0	0	0	0	0	0	0
Apr.	23,582,000	0	13	0	0	0	0	0	0	0
May	30,713,000	95,200	14	0.3099	2,5471	0	65.6	52.6	145	0
June	23,987,000	0	13	0	0	0	0	35.0	140	0
July	71,729,000	268,000	20	0.3741	1.1548	0	185	71.5	185	0
Aug.	168,012,000	2,071,000	18	1.2329	1.8545	0	1,426	492	1,430	95.7
Sept.	188,537,000	1,957,000	12	1.0379	0.2819	0	1,350	2,698	9,330	14.4
Oct.	37,269,000	0	14	0	0	0	0	3,360	12,400	0
Nov.	38,136,000	0	11	0	0	0	0	17.6	70.2	0
Dec.	39,611,000	0	13	0	0	0	0	0	0	0
Yearly	723,532,000	4,391,200	169	.6070	2,5471	0	3,030.6	6,727.8	21,903.3	284.7

Samples and Analyses by Mexican Section, Method B

Rio Grande at Lower Presidio Station

Period 1955-1959

Jan.	50,539,000	2,110	9	.004183			1.5	3.2	6.6	1.5
Feb.	31,149,000	2,400	8	.007716			1.7	3.6	8.5	1.4
Mar.	27,348,000	890	9	.003254			.61	1.4	2.8	.61
Apr.	24,695,000	774	8	.003133			.53	19.3	95.7	.13
May	35,073,000	3,210	9	.009150			2.2	32.9	161	.21
June	31,421,000	55,300	11	.1759			38.1	30.4	55.3	2.1
July	83,154,000	513,000	12	.6172			353	387	1,420	2.0
Aug.	173,100,000	775,000	12	.4476			534	506	1,360	66.8
Sept.	172,176,000	412,000	10	.2393			284	893	3,610	14.9
Oct.	41,584,000	6,940	9	.01668			4.8	1,114	4,770	4.8
Nov.	41,543,000	2,870	8	.006917			2.0	11.8	45.2	2.0
Dec.	42,640,000	2,600	8	.006096			1.8	2.0	2.6	1.4
Yearly	754,422,000	1,777,094	113	.2356			1,224.24	3,004.6	8,793.44	172.78

Samples and Analyses by U. S. Section, Method A

SUSPENDED SILT IN THE RIO GRANDE AND TRIBUTARIES

Month	1959						Period of Record		
	Tons		No. of Samples	Gravimetric Percentages			Acre-Feet at 1,452 Tons Per Acre Foot		
	Water	Silt		Average	Maximum Sample	Minimum Sample	Average	Maximum	Minimum

Rio Grande at Johnson Ranch, Texas

Period October 1951-1959

Jan.	62,006,000	6,000	4	.009668			4.1	2.1	4.1	.84
Feb.	34,871,000	2,500	5	.007309			1.7	32.9	253	.67
Mar.	28,846,000	927	7	.003214			.64	2.3	9.2	.20
Apr.	23,083,000	1,140	6	.00494			.79	114.0	692	.01
May	42,751,000	64,000	8	.1496			44.1	122.0	304	0
June	50,145,000	260,000	8	.5193			179	426.0	1,570	31.6
July	107,601,000	721,000	7	.6702			497	1,011	4,030	93.0
Aug.	170,602,000	2,288,000	5	1.3412			1,580	1,103	3,840	2.8
Sept.	190,531,000	1,060,000	7	.5565			730	1,462	* 8,990	98.5
Oct.	41,710,000	21,700	5	.05207			15.0	1,716	13,500	2.4
Nov.	42,425,000	57,400	5	.1354			39.6	11.4	45.2	.28
Dec.	41,589,000	3,100	7	.007460			2.1	7.0	48.3	.41
Yearly	836,160,000	4,485,767	74	.5365			3,094.03	6,009.7	23,869.62	803.27

Samples and Analyses by U. S. Section, Method A

Rio Grande at Langtry, Texas

Period April 1944-1959

Jan.	89,766,000	2,410	4	.002682			1.7	4.5	11.4	.94
Feb.	59,984,000	3,350	4	.005582			2.3	21.3	238	.31
Mar.	53,717,000	590	3	.001099			.41	6.2	27.0	.29
Apr.	45,810,000	1,410	5	.00308			.97	65.0	614	.14
May	92,648,000	1,000,000	3	1.0792			689	256	873	.95
June	91,486,000	71,500	4	.07811			49.2	453	2,450	.91
July	197,159,000	1,852,000	6	.9395			1,280	1,277	5,780	4.6
Aug.	180,139,000	1,530,000	4	.8491			1,050	1,050	3,900	4.7
Sept.	259,109,000	1,732,000	4	.6685			1,190	1,627	8,300	1.0
Oct.	119,001,000	61,300	4	.05153			42.2	1,206	8,760	5.1
Nov.	69,039,000	14,900	4	.02163			10.3	39.3	273	1.3
Dec.	67,015,000	5,710	4	.008520			3.9	7.1	46.8	.18
Yearly	1,324,873,000	6,275,170	49	.4736			4,319.98	6,012.4	17,860.74	645.10

Samples and Analyses by U. S. Section, Method A

Pecos River near Shumla, Texas

Period November 1954-1959

Jan.	17,972,000	561	4	.003120			.39	.38	.60	.20
Feb.	15,279,000	1,020	4	.006680			.70	.31	.70	.11
Mar.	15,648,000	886	5	.005663			.61	.37	.61	.18
Apr.	14,085,000	668	4	.004741			.46	33.8	167	.06
May	18,994,000	391	4	.002056			.27	81.7	407	.21
June	21,210,000	452	5	.00213			.31	.53	.85	.13
July	52,922,000	4,904	4	.009266			3.4	6.6	22.2	.08
Aug.	21,544,000	238	4	.001106			.16	5.0	23.8	.16
Sept.	34,995,000	109,000	5	.3129			75.1	27.8	75.1	.14
Oct.	137,776,000	86,900	5	.06306			59.8	22.2	59.8	.26
Nov.	26,137,000	598	4	.002289			.41	.58	1.1	.03
Dec.	22,132,000	799	4	.003611			.55	.26	.55	.14
Yearly	398,694,000	206,417	52	.05177			142.16	179.53	577.44	52.24

Samples and Analyses by U. S. Section, Method A

• Rio Grande near Del Rio, Texas

Period August 1955-1959

Jan.	199,078,000	9,320	11	.004680			6.4	5.4	9.2	.61
Feb.	151,637,000	7,860	11	.005181			5.4	47.6	178	.50
Mar.	150,633,000	7,290	13	.004837			5.0	13.0	34.6	.73
Apr.	135,119,000	3,030	13	.002240			2.1	155	612	.83
May	203,266,000	237,000	14	.1168			163	465	1,600	2.6
June	208,879,000	345,000	13	.1652			238	341	785	48.9
July	349,086,000	1,851,000	13	.5303			1,270	349	1,270	.87
Aug.	256,295,000	1,577,000	13	.6154			1,090	797	1,970	125
Sept.	347,398,000	1,886,000	13	.5429			1,300	1,767	4,800	154
Oct.	478,444,000	939,000	13	.1963			647	2,447	9,350	581
Nov.	178,356,000	18,000	10	.01012			12.4	109	410	10.7
Dec.	169,370,000	11,400	13	.006707			7.9	6.2	9.2	4.0
Yearly	2,827,561,000	6,891,900	150	.2437			4,747.2	6,502.2	15,563.3	1,008.37

Samples and Analyses by U. S. Section, Method A

" Estimated * Partly estimated • Discharge based on records of flow at gaging stations "Below Amistad Damsite" and "Arroyo las Vacas".

SUSPENDED SILT IN THE RIO GRANDE AND TRIBUTARIES

Month	1959						Period of Record		
	Tons		No. of Sam- ples	Gravimetric Percentages			Acre-Feet at 1,452 Tons Per Acre Foot		
	Water	Silt		Average	Maximum Sample	Minimum Sample	Average	Maximum	Minimum

Rio Grande at Laredo, Texas

Period 1953-1959

Jan.	297, 846, 000	22, 000	31	.007385			15.2	11.4	28.0	4.5
Feb.	237, 759, 000	27, 400	28	.01151			18.9	11.9	28.1	1.7
Mar.	206, 031, 000	12, 400	31	.006000			8.5	11.8	26.8	.78
Apr.	176, 271, 000	11, 700	30	.006614			8.1	330	1, 920	.47
May	239, 538, 000	90, 500	31	.0378			62.3	709	3, 540	2.3
June	305, 259, 000	455, 000	30	.1491			313	2, 342	12, 400	.62
July	371, 087, 000	1, 195, 000	31	.3221			823	982	3, 440	5.0
Aug.	241, 021, 000	475, 000	31	.1969			327	534	1, 960	4.2
Sept.	384, 188, 000	2, 269, 000	30	.5907			1, 560	1, 180	3, 670	41.3
Oct.	528, 650, 000	1, 344, 000	31	.2542			926	1, 633	7, 520	29.7
Nov.	242, 396, 000	20, 300	30	.008373			14.0	190	1, 190	6.1
Dec.	205, 950, 000	16, 800	31	.008178			11.6	8.8	18.9	2.8
Yearly	3,435,996,000	5, 939, 100	365	.1728			4, 087.6	7, 943.9	19, 257.72	734.10

Samples by Laredo Water Plant and Analyses by U. S. Section, Method C

Ø Rio Grande at Falcón Dam-U.S. Tailrace

Period July 1955-1959

Jan.	289, 559, 000	2, 990	12	.0010317			2.1	2.5	4.2	.96
Feb.	455, 058, 000	13, 200	10	.002897			9.1	3.3	9.1	.29
Mar.	471, 690, 000	6, 230	12	.001320			4.3	1.7	4.3	.16
Apr.	251, 264, 000	1, 810	12	.000720			1.2	4.0	12.2	.63
May	442, 011, 000	7, 390	12	.001673			5.1	4.0	5.2	2.1
June	343, 362, 000	3, 184	10	.009274			2.2	9.4	18.7	2.2
July	311, 130, 000	1, 760	13	.0005645			1.2	1.1	1.8	.54
Aug.	162, 636, 000	836	9	.0005138			.58	1.3	2.6	.29
Sept.	371, 842, 000	2, 660	14	.0007143			1.8	1.7	2.6	.77
Oct.	132, 188, 000	3, 110	9	.002356			2.1	8.6	37.5	.24
Nov.	57, 593, 000	720	6	.001250			.50	2.3	5.5	.50
Dec.	180, 400, 000	1, 900	8	.001053			1.3	4.6	14.7	1.3
Yearly	3,468, 733, 000	45, 790	127	.001320			32.68	44.5	92.15	23.69

Samples and Analyses by U. S. Section, Method A

Río Alamo at Cd. Mier, Tamaulipas

Period 1934-1959

Jan.	3, 661, 000	0	16	0	0.0007	0	0	0	2.5	21.8	0
Feb.	3, 283, 000	23, 0	12	0.0007	0.0022	0	.02	2.9	48.6	0	
Mar.	3, 019, 000	0	12	T	0.0011	0	0	8.5	91.6	0	
Apr.	833, 000	0	8	0	0	0	0	35.0	229	0	
May	300, 000	0	8	0	0	0	0	51.8	281	0	
June	40, 000	0	0	0	0	0	0	58.5	471	0	
July	169, 000	625	4	0.0037	0.006	0	.43	17.6	92.8	0	
Aug.	20, 748, 000	137, 000	12	0.660	0.880	0	94.4	165	1, 610	0	
Sept.	2, 770, 000	1, 610	14	0.058	0.0881	0	1.1	231	2, 920	0	
Oct.	4, 958, 000	13, 100	9	0.265	0.347	0	9.0	97.4	753	0	
Nov.	7, 151, 000	18, 400	14	0.258	0.941	0	12.7	2.9	40.7	0	
Dec.	1, 045, 000	0	10	0	0	0	0	.88	16.1	0	
Yearly	47, 977, 000	170, 758	119	0.3551	0.941	0	117.65	673.98	3, 156.57	97.18	

Samples and Analyses by Mexican Section, Method B

Rio Grande at Fort Ringgold, Rio Grande City, Texas Record began May 1959

Jan.	345, 020, 000										
Feb.	495, 089, 000										
Mar.	514, 282, 000										
Apr.	261, 912, 000										
May	432, 872, 000	5, 760	31	.001331				4.0			
June	340, 605, 000	6, 780	30	.001992				4.7			
July	317, 201, 000	4, 330	31	.001365				3.0			
Aug.	178, 392, 000	53, 600	31	.03004				36.9			
Sept.	374, 673, 000	29, 300	27	.007826				20.2			
Oct.	154, 171, 000	6, 830	31	.004431				4.7			
Nov.	69, 756, 000	6, 120	30	.008775				4.2			
Dec.	173, 532, 000	17, 600	31	.01012				12.1			
Yearly			242								

Samples and Analyses by U. S. Section, Method A

" Estimated T Trace # Some months missing Ø Discharges based on record of total releases from Falcón Reservoir

SUSPENDED SILT IN THE RIO GRANDE AND TRIBUTARIES

Month	1959						Period of Record		
	Tons		No. of Sam- ples	Gravimetric Percentages			Acre-Feet at 1,452 Tons Per Acre Foot		
	Water	Silt		Average	Maximum Sample	Minimum Sample	Average	Maximum	Minimum

† Rio Grande near Los Ebanos, Texas

Period May 1956-1959

Jan.	345,020,000	13,100	9	.003794			9.0	42.3	107	9.0
Feb.	495,089,000	11,200	8	.002262			7.7	11.4	14.0	7.7
Mar.	514,282,000	28,500	8	.005538			19.6	13.2	19.6	.65
Apr.	261,912,000	4,420	8	.001687			3.0	221	635	3.0
May	432,872,000	10,600	9	.002440			7.3	191	289	7.3
June	340,605,000	4,650	6	.001365			3.2	81.4	170	3.2
July	317,201,000	6,910	9	.002180			4.8	22.5	79.9	.74
Aug.	178,392,000	13,100	8	.007349			9.0	23.1	41.5	2.0
Sept.	374,673,000	20,500	9	.005462			14.1	114	366	14.1
Oct.	154,171,000	5,710	9	.003705			3.9	88.3	314	3.9
Nov.	69,756,000	12,300	8	.01759			8.5	21.6	75.1	.72
Dec.	173,532,000	4,060	9	.002339			2.8	9.6	16.3	2.8
Yearly	3,657,505,000	135,050	100	.003692			92.9	839.4	1,454.85	92.9

Samples and Analyses by U. S. Section, Method A

8 Rio Grande at Hidalgo, Texas

Period May 1956-1959

Jan.	342,464,000	12,100	4	.003520			8.3	19.6	49.0	1.5
Feb.	507,785,000	17,300	4	.003400			11.9	5.3	11.9	1.4
Mar.	519,727,000	10,000	5	.001928			6.9	2.5	6.9	.25
Apr.	219,017,000	5,500	5	.002510			3.8	64.3	171	3.8
May	176,899,000	1,990	3	.001124			1.4	50.3	79.9	1.4
June	189,790,000	41,600	5	.02191			28.6	33.3	67.4	14.7
July	211,441,000	57,500	4	.002720			39.6	22.2	41.7	.92
Aug.	109,091,000	1,570	5	.001440			1.1	7.5	23.1	.73
Sept.	161,730,000	13,100	4	.008127			9.0	27.9	75.1	6.5
Oct.	127,075,000	5,480	4	.004314			3.8	173	676	1.5
Nov.	53,579,000	1,160	5	.002160			.80	70.6	274	.80
Dec.	110,015,000	3,890	4	.003534			2.7	35.4	135	.62
Yearly	2,728,613,000	171,190	52	.006274			117.9	511.9	1,417.77	117.9

Samples and Analyses by U. S. Section, Method A

Rio Grande near San Benito, Texas

Period April 1955-1959

Jan.	308,521,000	175,000	4	.05663			121	32.3	121	.30
Feb.	493,148,000	142,000	4	.02888			97.8	25.3	97.8	.15
Mar.	489,913,000	73,500	4	.01500			50.6	13.5	50.6	.11
Apr.	160,552,000	26,000	4	.01622			17.9	8.1	17.9	.11
May	62,202,000	17,900	4	.02876			12.3	60.4	265	.54
June	76,185,000	24,900	5	.03270			17.1	10.8	27.2	2.1
July	50,312,000	46,100	4	.09171			31.7	8.3	31.7	.11
Aug.	45,242,000	9,180	5	.02028			6.3	2.1	6.3	.07
Sept.	44,888,000	15,900	4	.03538			11.0	34.3	132	1.9
Oct.	64,300,000	41,000	4	.06384			28.2	56.2	250	.34
Nov.	29,766,000	905	4	.003040			.62	49.8	247	.35
Dec.	35,076,000	8,600	5	.02452			5.9	34.6	163	.06
Yearly	1,860,105,000	580,985	51	.03123			400.42	335.7	851.95	23.27

Samples and Analyses by U. S. Section, Method A

Rio Grande at Lower Brownsville, Texas

Period April 1955-1959

Jan.	303,965,000	97,900	4	.03220			67.4	17.0	67.4	.02
Feb.	491,719,000	117,000	4	.02372			80.6	35.0	80.6	.04
Mar.	490,398,000	102,000	4	.02084			70.2	17.8	70.2	.08
Apr.	171,984,000	40,200	4	.02335			27.7	5.8	27.7	.04
May	46,005,000	9,330	4	.02028			6.4	14.8	58.5	.38
June	67,359,000	84,900	5	.1260			58.4	16.6	58.4	.29
July	39,078,000	15,000	4	.03837			10.3	60.7	292	.08
Aug.	43,994,000	11,700	5	.02665			8.1	2.2	8.1	.01
Sept.	33,529,000	3,120	4	.009320			2.1	10.2	46.3	0
Oct.	61,404,000	8,560	4	.01394			5.9	45.7	222	.03
Nov.	26,378,000	3,800	4	.01440			2.6	57.2	283	.12
Dec.	23,283,000	4,690	5	.02016			3.2	29.1	142	.02
Yearly	1,799,096,000	498,200	51	.02769			342.9	312.1	1,072.26	1.97

Samples and Analyses by U. S. Section, Method A

† Discharge based on record of flow at Fort Ringgold. § Discharge based on record of flow at "Below Anzalduas Dam"

plus return flow at "Poniente Drain".

**CHEMICAL ANALYSIS OF WATER SAMPLES FROM THE RIO GRANDE
AND TRIBUTARIES - 1959**

The following tables are based on chemical analyses of composites representative of the river flow at Rio Grande and tributary stations. The monthly composites were made by the United States Section of this Commission by taking from each independent water sample an amount of water volumetrically proportional to the river flow represented by that sample. The chemical analyses were made by the U. S. Department of Agriculture, Agricultural Research Service, U. S. Salinity Laboratory, Riverside, California. All other data were computed by the United States Section of this Commission.

To convert milligram equivalents to parts per million by weight, multiply each ion by its appropriate conversion factor. These factors are: Ca, 20; Mg, 12, 16; Na, 23; (CO₃ plus HCO₃) expressed as CO₃, 30; SO₄, 48; Cl, 35.5; NO₃, 62. To convert tons per acre-foot to parts per million, multiply tons per acre-foot by 735.5. Electrical conductivity, reported in the tables as ECx10⁶ at 25°C, is a relative measure of the total salt concentration.

Month	No. of Sam- ples	Dissolved Solids		Mean ECx10 ⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter				
		Tons Per Acre Foot	Total Tons						Ca	Mg	Na	CO ₃ + HCO ₃	SO ₄

Sampling by U. S. Section

Rio Grande at El Paso, Texas

Jan.	31	2.38	9,540	2,600	.32	7.9	64	37	7.08	2.66	17.23	4.83	12.37	10.05	T
Feb.	17	2.22	7,410	2,430	.34	8.0	62	35	6.86	2.58	15.58	4.90	11.68	8.85	.01
Mar.	26	.83	42,100	926	.15	7.9	44	23	3.91	1.23	4.12	3.17	4.00	2.20	.01
Apr.	30	1.10	42,600	1,240	.14	8.1	50	28	4.66	1.55	6.20	3.60	5.43	3.60	.01
May	31	1.12	50,100	1,260	.14	8.0	52	30	4.58	1.54	6.56	3.45	5.40	3.88	T
June	30	1.00	60,900	1,150	.14	7.8	50	28	4.42	1.40	5.72	3.50	4.93	3.30	T
July	31	1.05	65,300	1,180	.17	8.0	50	28	4.46	1.42	5.83	3.30	5.24	3.28	0
Aug.	31	1.05	69,700	1,150	.11	8.1	48	27	4.52	1.50	5.66	3.51	5.10	3.15	.01
Sept.	28	2.11	40,800	1,340	.17	8.2	51	28	5.03	1.64	7.08	3.93	6.23	3.88	.01
Oct.	31	2.14	18,100	2,320	.40	7.9	61	34	6.55	2.82	14.62	4.45	11.40	8.20	.01
Nov.	30	2.11	12,900	2,350	.37	8.3	62	34	6.41	2.68	15.12	4.55	11.56	8.35	.01
Dec.	29	2.22	14,600	2,400	.25	8.0	61	34	7.14	2.55	15.03	4.90	11.76	8.52	.01
Mean \bar{x}	9345	1.13	9434,050	1,260	.16	8.0	51	29	4.65	1.54	6.49	3.56	5.60	3.67	T
Period Avg.		1.10	509,000	1,220			52	29	4.37	1.60	6.59	3.51	5.43	3.73	
Tons of Constituents,									48,900	9,830	78,300	56,000	141,000	68,300	
Average Tons, Period									55,000	12,200	95,200	66,100	164,000	83,100	

Sampling by U. S. Section

Rio Grande at Fort Quitman, Texas

Jan.	4	9.54	306	9,970	.48	7.8	57	72	32.08	13.92	61.48	4.75	24.97	77.95	.02
Feb.	4	10.30	121	10,600	.54	7.9	56	74	34.64	15.48	64.96	4.20	25.46	85.50	.02
Mar. ^u	0	10.30	10.3	10,600	.54	7.9	56	74	34.64	15.48	64.96	4.20	25.46	85.50	.02
Apr.	No Flow														
May ^u	0	.59	974	664											
June ^u	0	.89	139	840	.03	7.8	3	1	8.25	.71	.29	2.30	7.08	.13	
July	1	.89	1,110	840	.03	7.8	3	1	8.25	.71	.29	2.30	7.08	.13	.01
Aug.	2	1.03	6,300	1,150	.20	8.0	54	31	3.97	1.30	6.26	3.41	4.66	3.70	.02
Sept.	3	9.01	2,210	9,310	.89	8.0	69	61	21.14	11.23	70.76	4.14	35.76	63.72	.02
Oct.	5	1.69	1,710	2,080	.40	7.8	61	44	6.04	2.17	12.68	3.25	8.51	9.30	.02
Nov.	4	4.07	5,170	4,480	.49	8.4	65	52	11.33	5.13	30.37	4.53	18.17	24.50	.01
Dec.	5	4.62	6,840	5,040	.52	7.9	63	56	13.84	6.02	33.22	5.10	18.80	30.05	.01
Mean \bar{x}	928	1.88	924,890.3	2,060			58	45	6.66	2.36	12.45	3.49	8.45	9.83	
Period Avg.		2.35	388,000	2,660			61	55	7.56	3.08	16.63	3.59	8.68	15.08	
Tons of Constituents,									2,400	516	5,150	1,880	7,300	6,270	
Average Tons, Period									34,000	8,410	85,800	24,200	93,600	120,000	

Sampling by U. S. Section

Rio Grande at Upper Presidio Station

Jan.	No Flow															
Feb.	No Flow															
Mar.	No Flow															
Apr.	No Flow															
May ^u	0	.52	47.4	595			42	#	3.47						.65	
June	3	.52	634	595			42	#	3.47						.65	
July	5	.72	1,140	713	.06	8.0	34	4	4.40		.47		2.52	2.47	.05	
Aug.	7	.62	1,980	689			43	#	3.91				2.98	2.65	1.22	
Sept.	3	.78	320	886			47	#	4.60				4.15	2.60	2.40	
Oct.	2	.47	343	542			37	#	3.43				2.02	2.45	.95	
Nov.	No Flow															
Dec.	No Flow															
Mean \bar{x}	920	.62	94,464.4	674			41	#	4.03				2.77	2.61		.96
Period Avg.	1,90	289,000	2,150				59	#	8.86				12.75	3.11		10.97
Tons of Constituents,													626	769		334
Average Tons, Period													60,600	19,300		80,400

^u Estimated T Trace \bar{x} Total ** Percent of total cations *** Percent of total anions * Sum of calcium and magnesium. \bar{x} Weighted mean

**CHEMICAL ANALYSIS OF WATER SAMPLES FROM THE RIO GRANDE
AND TRIBUTARIES - 1959**

Month	No. of Sam- ples	Dissolved Solids		Mean EC $\times 10^6$ @25°C	Boron p.p.m.	pH	% Na **	% Cl **	Mean Milligram Equivalents per Liter					
		Tons Per Acre Foot	Total Tons						Ca	Mg	Na	$\text{CO}_3 + \text{HCO}_3$	SO_4	Cl

Sampling by Mexican Section

Río Conchos near Ojinaga, Chihuahua

Jan.	13	1.48	54,700	1,520	.31	7.9	45	18	7.12	1.75	7.27	3.55	9.68	3.00	.09
Feb.	12	† 1.71	32,500	1,760		50		#†	9.13	9.12	†	3.07		4.02	
Mar.	13	1.77	33,700	1,770		49		#	9.50	9.08		3.35		3.90	
Apr.	13	1.66	28,800	1,700		50		#	8.94	8.87		3.21		3.70	
May	13	1.53	34,600	1,540		45		#	8.84	7.26		2.67		3.00	
June	13	1.62	28,600	1,690		53		#	8.15	9.29		2.95		3.90	
July	19	1.14	60,200	1,160	.22	8.0	42	15	5.92	1.05	5.04	2.40	7.92	1.82	.01
Aug.	19	.86	106,000	882		39		#	5.49	3.46		2.63		1.18	
Sept.	11	.79	110,000	831		42		#	4.95	3.58		2.95		1.50	
Oct.	14	1.51	41,400	1,560		53		#	7.60	8.56		2.80		3.35	
Nov.	13	1.41	39,600	1,480		53		#	7.22	8.04		2.80		2.90	
Dec.	13	1.35	39,400	1,410		52		#	6.81	7.36		2.93		2.70	
Mean@	166	1.14	609,500	1,180		46		#	6.62	5.56		2.86		2.19	
Period Avg.		.66	522,000	698		39		#	4.39	2.76		2.61		1.01	
Tons of Constituents,										92,600	62,100			56,200	
Average Tons, Period										68,800	84,700			38,800	

Sampling by U. S. Section

Rio Grande at Johnson Ranch, Texas

Jan.	4	1.58	72,000	1,610	.36	7.8	45	19	7.44	1.90	7.78	3.45	10.44	3.35	.09
Feb.	5	1.82	46,800	1,860		48		#	10.13	9.46		3.11		4.60	
Mar.	7	1.87	39,600	1,890		51		#	9.76	9.90		2.51		4.85	
Apr.	6	1.85	31,400	1,900		51		#	9.76	9.96		2.51		4.90	
May	8	1.33	41,900	1,380		48		#	7.42	6.83		2.65		2.90	
June	8	1.35	49,800	1,400		48		#	7.52	6.83		2.55		2.88	
July	9	1.08	85,500	1,120	.23	7.8	44	16	5.55	.85	5.06	2.75	7.13	1.90	.01
Aug.	7	.85	107,000	869		34		#	5.96	3.02		2.47		.92	
Sept.	9	.74	104,000	799		41		#	4.78	3.30		3.00		1.30	
Oct.	5	1.57	48,200	1,610		52		#	8.01	8.77		2.70		3.60	
Nov.	5	1.36	42,400	1,450		51		#	7.30	7.75		2.80		3.00	
Dec.	7	1.46	44,700	1,520		51		#	7.78	7.98		3.20		3.10	
Mean@	80	1.16	713,300	1,200		45		#	6.84	5.59		2.81		2.28	
Period Avg.		.86	547,000	908		43		#	5.35	3.96		2.71		1.62	
Tons of Constituents,										108,000	70,600			67,700	
Average Tons, Period										78,800	70,400			49,700	

Sampling by U. S. Section

Rio Grande at Langtry, Texas

Jan.	4	1.24	82,000	1,300	.29	7.9	43	19	5.87	1.84	5.85	3.18	7.86	2.68	.07
Feb.	4	1.25	55,100	1,320	.28	8.0	43	21	5.93	2.00	5.94	3.10	7.95	2.92	.06
Mar.	3	1.24	49,000	1,310	.32	7.9	45	22	5.39	2.10	6.03	2.83	7.75	3.00	.03
Apr.	5	1.13	38,100	1,230	.24	8.0	44	23	4.86	2.08	5.54	2.63	7.09	2.85	.02
May	3	.82	55,100	886	.14	8.0	48	14	3.79	.89	4.37	2.90	4.94	1.25	.02
June	4	.80	53,800	869	.15	8.0	37	15	4.46	1.09	3.27	2.70	4.95	1.40	.03
July	6	.78	113,000	834	.13	7.9	36	13	4.68	.83	3.12	3.00	4.62	1.10	.02
Aug.	4	.90	120,000	945	.20	7.9	40	15	4.86	.99	3.85	2.95	5.21	1.50	.02
Sept.	4	.61	117,000	669	.16	8.0	34	13	3.87	.71	2.32	2.93	3.20	.92	.05
Oct.	4	.40	78,800	963	.21	7.7	43	19	4.28	1.36	4.22	2.73	5.29	1.90	.04
Nov.	4	† 1.11	56,400	1,190	.27	8.1	48	20	† 4.67	1.74	5.85	† 2.91	6.84	2.50	.02
Dec.	4	1.10	54,200	1,170	.23	7.9	45	19	4.87	1.72	5.50	3.09	6.86	2.30	.03
Mean@	49	.90	873,300	956	.19	7.9	41	17	4.61	1.21	4.04	2.92	5.34	1.68	.03
Period Avg.		.75	754,000	785		40		19	3.87	1.06	3.34	2.71	3.88	1.58	
Tons of Constituents,									123,000	19,500	123,000	116,000	340,000	79,000	
Average Tons, Period									106,000	17,700	105,000	111,000	255,000	76,500	

† Total @ Weighted Mean ** Percent of total cations *** Percent of total anions # Sum of calcium and magnesium

† Analysis corrected due to partial precipitation of Ca CO₃ before analysis.

**CHEMICAL ANALYSIS OF WATER SAMPLES FROM THE RIO GRANDE
AND TRIBUTARIES - 1959**

Month	No. of Sam- ples	Dissolved Solids		Mean ECx10 ⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter				
		Tons Per Acre Foot	Total Tons						Ca	Mg	Na	CO ₃ + HCO ₃	SO ₄

Sampling by U. S. Section

Pecos River near Shumla, Texas

Jan.	4	3.01	39,700	3,530	.23	7.9	59	63	8.47	6.17	20.67	3.07	9.85	22.50	.06
Feb.	4	3.20	35,800	3,730	.28	8.0	59	64	8.55	6.66	22.18	2.90	10.41	24.22	.06
Mar.	5	3.38	38,900	3,800	.27	7.9	59	65	8.71	6.72	22.48	2.85	10.33	24.75	.04
Apr.	4	3.08	32,000	3,650	.24	8.0	60	65	8.11	6.37	21.82	2.55	10.13	23.70	.03
May	4	3.13	43,800	3,590	.20	7.9	61	66	7.70	6.22	21.75	2.25	9.92	23.68	.01
June	5	3.22	50,200	3,760	.26	8.0	62	66	7.89	6.30	23.31	2.33	10.53	24.82	.01
July	4	1.71	66,500	2,060	.13	7.9	57	61	5.21	3.28	11.41	2.50	5.35	12.12	.02
Aug.	4	1.67	26,600	1,980	.09	8.2	57	60	4.93	3.49	11.09	2.60	5.27	11.80	.05
Sept.	5	1.09	28,100	1,310	.10	8.0	51	55	4.07	2.10	6.49	2.63	3.00	6.98	.04
Oct.	5	1.15	116,000	1,380	.11	7.7	50	53	4.34	2.27	6.70	2.60	3.58	7.10	.10
Nov.	4	1.72	33,000	2,120	.19	8.4	54	58	5.68	3.91	11.46	3.10	5.63	12.35	.10
Dec.	4	2.37	38,600	2,770	.20	7.8	56	61	7.00	5.05	15.34	3.15	7.45	16.85	.08
Mean \oplus	ø 52	1.87	ø 549,200	2,220	.16	7.9	57	61	5.70	3.78	12.32	2.66	5.92	13.26	.06
Period Avg.		1.82	463,000	2,130			55	60	5.73	3.72	11.61	2.56	5.97	12.61	
Tons of Constituents,									45,500	18,300	113,000	31,800	113,000	187,000	
Average Tons, Period									39,800	15,700	92,600	26,600	99,500	155,000	

Sampling by U. S. Section

Rio Grande at Laredo, Texas

Jan.	31	.84	184,000	958	.13	7.8	39	29	4.24	1.63	3.79	3.00	3.83	2.80	.11
Feb.	28	.82	143,000	948					# 5.51		3.92	2.60		3.15	
Mar.	31	.90	136,000	1,020					# 5.69		5.02	2.64		2.92	
Apr.	30	.86	112,000	995					# 5.65		4.20	2.65		3.48	
May	31	.83	146,000	939					# 5.39		3.96	2.70		3.10	
June	30	.64	144,000	777					# 4.70		2.99	2.55		2.40	
July	31	.67	183,000	758	.11	7.9	39	26	3.59	.97	2.92	2.50		1.95	.08
Aug.	31	.74	131,000	837					# 4.74		3.54	2.50		2.48	
Sept.	30	.58	164,000	660					# 4.30		2.34	2.65		1.22	
Oct.	31	.53	206,000	614					# 4.14		2.08	2.55		1.65	
Nov.	30	.76	136,000	894					# 5.27		3.62	2.87		2.70	
Dec.	31	.85	129,000	964					# 5.59		4.06	2.97		3.00	
Mean \oplus	ø 365	.72	ø 1,814,000	825			40		# 4.96		3.30	2.66		2.39	
Period Avg.		.61	1,705,000	705			37		# 4.42		2.61	2.53		1.90	
Tons of Constituents,											261,000	274,000		291,000	
Average Tons, Period											227,000	287,000		254,000	

Sampling by Mexican Section

Rio Salado at Las Tortillas, Tamaulipas

Jan.	3	.79	45,100	887	.11	8.0	27	20	5.16	1.57	2.52	3.25	4.04	1.90	.15
Feb.	4	1.38	92,300	1,460					# 9.86		5.52	3.20		4.10	
Mar.	3	1.02	30,300	1,090					# 7.70		3.59	3.00		2.65	
Apr.	1	2.37	26,400	2,360					# 15.11		10.69	3.10		7.75	
May	4	2.76	27,700	2,680					# 16.78		12,80	2.65		8.62	
June	4	2.30	16,200	2,310					# 13.91		11,06	2.35		7.55	
July	9	2.05	27,300	2,080	.58	7.8	44	29	8.29	4.22	9.73	2.35	13.52	6.50	.11
Aug.	5	2.46	34,400	2,430					# 14.94		11,24	2.53		7.60	
Sept.	4	2.60	11,900	2,550					# 15.63		12,47	2.15		8.20	
Oct.	4	3.84	19,000	3,600					# 23.67		18,17	2.40		11,85	
Nov.	4	3.97	16,800	3,690					# 24.53		18,70	2.60		11,90	
Dec.	0	4.15	9,750	3,880					# 25.66		19,62	2.66		12,64	
Mean \oplus	ø 45	1.59	ø 357,150	1,620			38		# 10.81		6.67	2.98		4.69	
Period Avg.		.56	226,000	635			26		# 4.85		1.69	2.68		1.24	
Tons of Constituents,											47,000	27,400		50,900	
Average Tons, Period											21,100	43,700		23,900	

^u Estimated ^ø Total [⊕] Weighted Mean ** Percent of total cations *** Percent of total anions

Sum of calcium and magnesium.

**CHEMICAL ANALYSIS OF WATER SAMPLES FROM THE RIO GRANDE
AND TRIBUTARIES - 1959**

Month	No. of Sam- ples	Dissolved Solids		Mean ECx10 ⁶ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter					
		Tons Per Acre Foot	Total Tons						Ca	Mg	Na	CO ₃ + HCO ₃	SO ₄	Cl

Sampling by U. S. Section **Rio Grande at Falcón Dam-U.S. Tailrace**

Jan.	12	.51	109,000	589	.07	7.8	.29	18	3.43	.75	1.74	2.61	2.18	1.10	.08
Feb.	10	.53	178,000	610	.13	8.0	.30	19	3.31	.99	1.83	2.65	2.26	1.15	.08
Mar.	12	.57	198,000	636	.14	7.8	.30	21	3.61	.77	1.91	2.70	2.20	1.30	.07
Apr.	12	.56	104,000	688	.18	8.0	.32	21	3.71	1.05	2.20	2.75	2.68	1.50	.06
May	12	.66	214,000	727	.11	7.8	.34	23	3.63	1.14	2.49	2.63	2.98	1.70	.06
June	10	.64	162,000	750	.09	7.9	.36	25	3.57	1.18	2.69	2.50	3.12	1.92	.05
July	13	.69	158,000	782	.13	7.8	.39	28	3.43	1.30	3.00	2.27	3.33	2.23	.02
Aug.	9	.69	82,800	784	.15	7.9	.40	29	3.30	1.32	3.14	2.05	3.57	2.30	.01
Sept.	14	.67	184,000	788	.14	7.9	.41	30	3.24	1.32	3.21	2.07	3.43	2.32	.02
Oct.	9	.68	66,200	796	.16	7.7	.41	29	3.22	1.42	3.20	2.07	3.50	2.32	.02
Nov.	6	.69	29,300	814	.09	8.0	.41	28	3.14	1.62	3.28	1.85	3.92	2.30	.01
Dec.	8	.72	95,800	795	.15	7.6	.41	29	3.23	1.38	3.14	2.20	3.43	2.28	T
Mean Θ	Ø127	.62	Ø1,581,100	709	.13	7.9	.35	24	3.45	1.11	2.49	2.46	2.87	1.74	.05
Period Avg.		.59	1,607,000	684			38	27	3.19	1.03	2.56	2.36	2.58	1.87	
Tons of Constituents,									240,000	46,900	199,000	256,000	479,000	214,000	
Average Tons, Period									238,000	46,600	219,000	263,000	461,000	247,000	

Sampling by U. S. Section **Rio Grande at Fort Ringgold, Rio Grande City, Texas**

Jan.	31	.57	145,000	656	.15	7.9	.33	23	3.67	.75	2.16	2.68	2.36	1.50	.09
Feb.	28	.54	197,000	621	.07	8.0	.31	20	3.09	1.21	1.94	2.63	2.35	1.28	.08
Mar.	31	.59	223,000	658	.05	7.8	.31	22	3.63	.99	2.07	2.70	2.44	1.45	.07
Apr.	30	.65	125,000	755	.11	7.8	.35	25	3.89	1.05	2.63	2.83	2.83	1.95	.06
May	31	.68	217,000	763	.09	8.0	.35	25	3.73	1.18	2.69	2.67	3.04	1.90	.07
June	30	.68	171,000	803	.11	7.9	.38	27	3.73	1.29	3.02	2.63	3.23	2.20	.05
July	31	.70	163,000	810	.16	7.9	.40	28	3.53	1.30	3.18	2.37	3.41	2.25	.04
Aug.	31	.75	98,200	876	.21	8.1	.43	32	3.59	1.34	3.72	2.40	3.52	2.78	.03
Sept.	27	.69	190,000	809	.16	8.0	.41	30	3.41	1.30	3.31	2.23	3.45	2.40	.02
Oct.	31	.79	89,300	930	.22	7.7	.45	35	3.45	1.48	4.09	2.21	3.74	3.20	.02
Nov.	30	.86	44,100	1,010	.21	8.1	.47	37	3.71	1.52	4.72	2.30	3.98	3.70	.02
Dec.	31	.76	97,300	845	.16	7.7	.43	31	3.43	1.29	3.56	2.25	3.58	2.58	.01
Mean Θ	Ø362	.65	Ø1,759,900	752	.12	7.9	.37	26	3.55	1.17	2.77	2.55	2.97	1.99	.06
Period Avg.															
Tons of Constituents,									260,000	52,100	233,000	280,000	522,000	258,000	
Average Tons, Period															

Sampling by Mexican Section

Rio Grande Below Anzaldás Dam

Jan.	4	.91	229,000	1,030	50	28	4.16	.85	5.08	2.74	4.44	2.83	.09		
Feb.	4	.69	258,000	781	40	30	3.27	1.33	3.05	2.54	2.79	2.24	.08		
Mar.	9	.71	272,000	796	.15	7.8	.40	31	3.64	1.03	3.08	2.52	2.80	2.45	.06
Apr.	8	.94	152,000	1,110	.24	8.0	.46	41	4.33	1.50	5.00	2.73	3.66	4.48	.06
May	9	.92	120,000	1,070	.25	8.0	.48	40	4.03	1.48	4.99	2.60	3.74	4.18	.05
June	8	.98	137,000	1,180	.28	7.9	.49	42	4.26	1.64	5.59	2.61	4.13	4.90	.03
July	8	1.01	157,000	1,180	.30	7.8	.49	41	4.14	1.70	5.65	2.53	4.33	4.75	.02
Aug.	8	1.04	83,500	1,230	.34	8.0	.52	46	3.99	1.74	6.20	2.27	4.28	5.48	.01
Sept.	7	.85	101,000	1,010	.19	8.1	.47	38	3.69	1.58	4.72	2.31	4.01	3.85	.01
Oct.	4	1.05	98,200	1,220	.35	7.9	.51	43	4.01	1.84	6.12	2.35	4.51	5.15	.01
Nov.	5	1.73	68,200	2,070	.61	7.9	.58	54	5.68	2.91	11.71	2.73	6.76	10.92	.01
Dec.	5	1.14	92,300	1,320	.33	7.9	.53	45	4.18	1.95	6.94	2.47	4.76	5.88	.01
Mean Θ	Ø79	.88	Ø1,768,200	1,020		47	37	3.89	1.40	4.67	2.55	3.71	3.72	.05	
Period Avg.															
Tons of Constituents,									213,000	46,500	293,000	209,000	487,000	360,000	
Average Tons, Period															

T Trace Ø Total Θ Weighted Mean ** Percent of total cations *** Percent of total anions

† Samples collected at Hidalgo, Texas. Analyses deduced from Fort Ringgold analyses. ‡ Tonnage figures based on total releases from Falcón Reservoir.

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1959

The following tables show electrical conductivity, expressed in mhos per centimeter cube $\times 10^6$ at 25°C, of individual water samples taken at Rio Grande and tributary stations. The determinations were made by the United States Section of this Commission.

Electrical conductivity is a relative indication of the content of dissolved solids in the water samples. Though no exact relationship exists between conductivity and dissolved solids in natural waters, a study of recent data pertaining to stations on the Rio Grande watershed indicates that the relationship may be expressed within 10% by the following equations:

Tons per acre-foot = .0008878 ($EC \times 10^6$ at 25°C) when conductivity ($EC \times 10^6$ at 25°C) is below 7,520 micromhos.

Tons per acre-foot = .001052 ($EC \times 10^6$ at 25°C) - 1.235 when conductivity ($EC \times 10^6$ at 25°C) ranges between 7,520 and 22,000 micromhos.

Date	$EC \times 10^6$ @25°C												
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Rio Grande at El Paso, Texas

January	February	April	May	July	August	October	November
1 2,310	23 2,420	14 1,230	28 1,250	9 1,240	22 1,170	4 2,250	17 2,430
2 2,340	24 2,420	15 1,190	29 1,090	10 1,280	23 1,150	5 2,300	18 2,350
3 2,330	25 2,430	16 1,250	30 1,180	11 1,160	24 1,330	6 2,310	19 2,360
4 2,420	26 2,430	17 1,390	31 1,120	12 1,080	25A 1,030	7 2,220	20 2,360
5 2,370	March	18 1,390	June	13 1,200	25B 1,180	8 2,260	21 2,380
6 2,360	6 945	19 1,440	1 1,140	14 1,150	26A 1,160	9 2,200	22 2,360
7 2,460	7 916	20 1,420	2 1,170	15 1,200	26B 778	10 2,270	23 2,380
8 2,490	8 930	21 1,490	3A 1,130	16 1,180	27 1,180	11 2,270	24 2,480
9 2,490	9 957	22 1,680	3B 1,030	17 1,140	28 1,120	12 2,260	25 2,370
10 2,470	10 862	23 1,790	4 1,140	18 1,210	29 1,220	13 2,240	26 2,310
11 2,500	11 877	24 1,960	5 1,100	19 1,120	30 1,260	14 2,270	27 2,290
12 2,430	12 890	25 1,470	6 1,110	20 1,100	31 1,200	15 2,250	28 2,340
13 2,340	13 874	26 1,280	7 1,130	21 1,060	September	16 2,220	29 2,370
14 2,620	14 844	27 1,190	8 1,140	22 1,110	1 1,270	17 2,340	30 2,360
15 2,680	15 862	28 1,180	9 1,130	23 1,270	2 1,260	18 2,430	December
16 2,740	16 870	29 1,250	10 1,160	24 1,270	3 1,250	19 2,270	1 2,470
17 2,670	17 863	30 1,210	11 1,210	25 1,270	4 1,110	20 2,280	2 2,340
18 2,710	18 859	May	12 1,190	26 1,200	5 1,070	21 2,390	3 2,330
19 2,710	19 859	1 1,190	13 1,130	27 1,150	6 960	22 2,360	4 2,370
20 2,710	20 882	2 1,060	14 1,100	28 1,120	7 990	23 2,400	5 2,400
21 2,590	21 870	3 1,120	15 1,030	29 1,170	8 1,000	24 2,430	6 2,380
22 2,720	22 882	4 1,170	16 1,030	30 1,240	9 1,090	25 2,430	7 2,520
23 2,810	23 955	5 1,280	17 1,100	31 1,200	10 1,140	26 2,420	8 2,470
24 2,880	24 977	6 1,270	18 1,180	August	11 1,190	27 2,470	9 2,340
25 2,710	25 1,010	7 1,460	19 1,220	1 1,190	12 1,370	28 2,460	10 2,460
26 2,730	26 1,090	8 1,500	20 1,230	2 1,200	13 1,420	29 2,450	11 2,360
27 2,740	27 1,080	9 1,350	21 1,180	3 1,200	14 1,530	30 2,400	12 2,370
28 2,720	28 1,080	10 1,400	22 1,230	4 1,200	16 1,430	31 2,360	13 2,350
29 2,730	29 1,040	11 1,300	23 1,270	5 1,240	17 1,480	November	14 2,350
30 2,740	30 1,060	12 1,300	24 1,240	6 1,120	18 1,660	1 2,350	15 2,510
31 2,700	31 1,030	13 1,450	25 1,280	7 1,180	19 1,940	2 2,200	16 2,340
February	April	14 1,490	26 1,210	8 1,160	20 2,050	3 2,340	17 2,450
1 2,730	1 1,010	15 1,280	27 1,060	9 1,130	21 2,040	4 2,220	18 2,480
11 2,310	2 1,000	16 1,210	28 1,050	10 1,070	22 2,060	5 2,290	19 2,390
12 2,230	3 1,100	17 1,160	29 1,040	11 1,080	23 1,330	6 2,410	20 2,390
13 2,330	4 1,130	18 1,090	30 1,010	12 1,130	24 2,050	7 2,220	21 2,340
14 2,340	5 1,030	19 1,280	July	13 1,220	25 2,180	8 2,270	22 2,370
15 2,360	6 1,050	20 1,290	1 1,080	14 1,160	26 2,100	9 2,380	23 2,370
16 2,340	7 1,090	21 1,310	2 1,160	15 1,070	27 2,220	10 2,380	26 2,330
17 2,310	8 1,060	22 1,310	3 1,000	16 1,080	28 2,170	11 2,420	27 2,360
18 2,400	9 1,050	23 1,270	4 1,110	17 1,020	29 2,230	12 2,250	28 2,390
19 2,390	10 1,220	24 1,260	5 1,180	18 1,120	October	13 2,430	29 2,490
20 2,410	11 1,170	25 1,210	6 1,230	19 1,150	1 2,150	14 2,270	30 2,370
21 2,450	12 1,100	26 1,290	7 1,280	20 1,190	2 2,150	15 2,240	31 2,330
22 2,320	13 1,200	27 1,240	8 1,360	21 1,140	3 2,120	16 2,400	

Rio Grande at Fort Quitman, Texas

January	February	July	September	October	October	November	December
7 9,750	4 10,070	1 846	2 3,980	3 1,470	29 1,240	18 4,240	9 4,920
14 9,750	11 10,380	August	23 9,820	14 5,890	November	25 5,600	16 4,690
21 9,950	18 10,710	20 541	30 13,750	21 6,850	5 3,420	December	23 4,310
28 10,050	25 10,710	26 1,510	28 7,400	12 5,260	2 4,850	30 6,220	

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1959

Date	ECx10 ⁶ @25°C												
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Rio Grande at Langtry, Texas

January	February	April	June	July	September	October	December
1 1,320	27 1,340	16 1,160	1 770	20 407	3 673	29 1,200	4 1,130
16 1,200	March 5 1,300	23 1,180	12 951	24 783	11 437	November 5 1,220	11 1,160
23 1,320	30 1,340	19 1,010	30 914	17 747	13 1,080	18 1,180	18 1,190
30 1,340	17 1,280	May 26	748	August 24 1,110	20 1,230	27 1,210	31 1,190
February 26	1,290	7 882	July 6 956	October 2 414			
5 1,290	April 14 1,130	2 1,220	14 1,150	7 955			
13 1,330	2 1,260	21 758	9 1,170	21 923			
17 1,340	9 1,240	16 809	28 914	14 1,040			

Pecos River near Shumla, Texas

January	February	April	May	July	August	October	November
6 3,440	17 3,770	7 3,680	19 3,400	6 2,870	25 2,080	2 781	17 2,110
13 3,490	24 3,800	14 3,600	24 3,760	13 2,840	September 6 1,020	6 1,020	24 2,250
22 3,540	March 21 3,680	21 3,660	June 22 1,660	1 2,050	13 2,620	December 20 2,270	1 2,390
27 3,620	4 3,800	28 3,660	1 4,110	28 1,920	9 2,120	27 2,120	8 2,640
February 10 3,780	May 5 3,770	8 5,270	August 15 1,940	15 2,070	November 22 2,910	3 2,030	29 3,070
3 3,630	17 3,830	5 3,440	15 3,360	4 1,940	22 2,080	10 2,120	
10 3,690	24 3,780	15 3,450	22 3,250	11 1,980	30 693		
	31 3,740		29 2,680	18 2,090			

Devils River near Mouth

January	March	April	May	July	September	October	December
19 389	2 374	17 362	28 339	8 351	4 358	22 282	7 376
28 392	16 384	24 366	June 25	August 18 359	30 342	16 386	
February April		May 3 366	7 337	October 15 322	November 4 347	23 396	
5 398	3 390	8 374	11 360	20 335	31 270	30 385	
9 355	10 388	15 353	18 365	26 339	21 270	18 373	
16 391		22 328		27 333			

Rio Grande near Del Rio, Texas

January	February	April	May	July	August	September	November
1 1,070	20 1,140	6 1,040	20 607	1 1,090	17 850	30 894	13 973
7 1,110	24 1,150	8 994	22 769	6 818	19 971	October 16 931	
12 1,150	26 1,160	10 2,020	25 861	8 958	21 1,160	2 376	20 990
14 1,110	March 13 1,000	27 908	10 1,060	24 761	5 356	23 999	
16 1,060	2 1,090	15 2,020	29 1,180	13 791	26 748	7 425	25 1,030
19 1,040	4 1,070	17 1,030	June 15	28 787	28 772	9 750	30 996
21 1,070	6 1,100	20 1,020	1 1,180	17 832	31 674	12 1,060	December 1,060
23 1,130	9 1,130	22 999	3 1,110	20 474	September 14 429	2 988	
26 1,150	11 1,130	24 975	5 954	22 524	2 717	16 1,040	5 963
28 1,130	13 1,150	27 1,030	8 1,150	24 808	4 617	19 1,130	7 963
30 1,140	16 1,110	May 10 904	27 1,130	7 497	21 1,090	9 1,010	
February 18 1,100	1 1,050	12 985	29 799	9 522	23 1,030	11 1,040	
2 1,120	20 1,080	2 924	15 935	31 780	11 572	26 985	14 1,010
4 1,120	23 1,130	4 1,190	17 947	August 14 658	28 987	16 1,030	
6 1,100	25 1,080	6 694	19 809	3 735	16 711	30 990	18 1,030
9 1,110	27 1,080	8 1,000	22 879	5 812	18 673	November 21 1,030	
12 1,120	30 1,070	11 889	24 743	7 840	21 786	2 885	23 1,010
13 1,080	April 13 1,150	26 552	10 863	23 844	4 1,010	28 1,200	
16 1,130	1 1,030	15 1,010	29 695	12 875	25 896	6 970	30 1,080
18 1,140	3 1,010	18 1,040	14 900	28 958	9 1,000	31 1,070	

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Rio Grande at Maverick Canal Headgate

January	February	April	May	July	August	October	November
1 1,130	16 1,100	1 1,050	17 408	1 870	16 910	1 925	17 960
2 1,110	17 1,100	2 1,060	18 1,420	2 985	17 885	2 366	18 994
3 1,120	18 1,120	3 1,070	19 1,090	3 1,290	18 888	3 625	19 1,000
4 1,100	19 1,100	4 1,040	20 603	4 1,180	19 889	4 362	20 991
5 1,130	20 1,140	5 1,040	21 714	5 764	20 877	5 475	21 986
6 1,110	21 1,120	6 1,060	22 751	6 755	21 908	6 318	22 971
7 1,130	22 1,110	7 1,050	23 941	7 623	22 1,040	7 406	23 1,010
8 1,130	23 1,110	8 971	24 807	8 767	23 814	8 523	24 949
9 1,140	24 1,120	9 1,010	25 777	9 862	24 743	9 740	25 1,040
10 1,100	25 1,140	10 1,030	26 889	10 1,070	25 1,077	10 833	26 1,000
11 1,130	26 1,180	11 981	27 924	11 943	26 818	11 893	27 958
12 1,100	27 1,140	12 984	28 921	12 996	27 747	12 947	28 1,000
13 1,130	28 1,130	13 985	29 1,030	13 821	28 922	13 1,120	29 980
14 1,090	March	14 988	30 1,030	14 784	29 749	14 513	30 982
15 1,090	1 1,110	15 998	31 1,150	15 782	30 840	15 495	December
16 1,070	2 1,110	16 997	June	16 746	31 772	16 972	1 995
17 1,040	3 1,140	17 998	1 1,070	17 866	September	17 1,030	2 986
18 1,050	4 1,110	18 988	2 1,200	18 887	1 771	18 1,100	3 980
19 1,060	5 1,100	19 973	3 1,160	19 738	2 732	19 1,100	4 979
20 1,050	6 1,030	20 974	4 1,020	20 1,070	3 660	20 1,090	5 970
21 1,040	7 1,070	21 969	5 962	21 805	4 598	21 1,060	6 1,020
22 1,010	8 1,190	22 981	6 981	22 589	5 700	22 1,070	7 992
23 1,090	9 1,190	23 1,010	7 428	23 687	6 570	23 1,030	8 1,000
24 1,110	10 1,110	24 982	8 1,070	24 908	7 504	24 811	9 999
25 1,110	11 1,090	25 934	9 1,290	25 918	8 505	25 1,010	10 1,000
26 1,120	12 1,100	26 982	10 944	26 1,110	9 534	26 981	11 1,010
27 1,120	13 1,120	27 1,010	11 876	27 1,110	10 592	27 1,010	12 1,030
28 1,100	14 1,090	28 988	13 1,170	28 1,010	11 555	28 1,010	13 1,040
29 1,110	15 1,090	29 988	14 891	29 800	12 621	29 1,000	14 998
30 1,100	16 1,090	30 1,010	15 790	30 784	13 632	30 993	15 1,050
31 1,100	17 1,080	May	16 961	31 775	14 542	November	16 1,060
February	18 1,090	1 1,030	17 894	August	15 708	1 900	17 1,020
1 1,120	19 1,070	2 891	18 948	1 791	16 747	2 880	18 1,070
2 1,110	20 1,070	3 810	19 864	2 854	17 764	3 936	19 1,040
3 1,090	21 1,040	4 915	20 819	3 847	18 664	4 966	20 1,070
4 1,100	22 1,020	5 1,180	21 818	4 734	19 747	5 947	21 1,060
5 1,090	23 1,090	6 715	22 1,480	5 776	20 803	6 950	22 1,090
6 1,090	24 1,100	7 792	23 889	6 830	21 803	7 956	23 1,080
7 1,090	25 1,070	8 1,040	24 858	7 782	22 847	8 990	24 1,070
8 1,070	26 1,070	9 898	25 686	8 832	23 884	9 991	25 1,080
9 1,080	27 1,070	10 1,030	26 479	9 839	24 884	10 1,000	26 1,060
10 1,090	28 1,030	11 950	27 423	10 836	25 878	11 1,000	27 1,060
11 1,090	29 1,050	12 1,020	28 508	11 860	26 903	12 982	28 1,080
12 1,100	30 1,040	13 1,290	29 712	12 869	27 970	13 942	29 1,120
13 1,100	31 1,050	14 1,080	30 748	13 863	28 975	14 1,000	30 1,080
14 1,090	15 1,120	16 1,080	15 933	14 863	29 744	15 957	31 1,060

Rio Grande at San Antonio Crossing near Villa Guerrero, Coahuila

January	February	April	May	July	August	October	November
5 962	20 1,000	3 1,020	22 902	2 707	14 833	2 840	20 920
12 1,010	27 1,020	10 974	29 893	10 828	21 892	9 464	27 957
19 919	March	17 974	June	17 819	28 769	16 630	December
23 922	6 1,040	24 974	5 1,130	24 570	September	23 999	4 924
30 1,010	13 1,020	May	12 1,090	31 958	4 741	30 944	11 953
February	20 1,050	1 974	19 911	August	11 561	November	18 996
6 960	27 1,020	8 1,050	26 673	7 771	18 691	6 891	26 1,040
13 954	15 933			15 879	30 900	16 932	

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Rio Grande at Laredo, Texas

January	February	April	May	July	August	October	November
1 927	17 962	4 1,030	21 914	6 824	21 819	6 383	22 869
2 925	18 940	5 1,020	22 723	7 949	22 823	7 438	23 876
3 935	19 956	6 1,010	23 1,080	8 1,050	23 845	8 364	24 897
4 916	20 969	7 1,020	24 1,100	9 1,060	24 857	9 382	25 906
5 861	21 971	8 1,010	25 932	10 755	25 850	10 343	26 899
6 857	22 949	9 1,020	26 852	11 738	26 979	11 398	27 913
7 964	23 967	10 1,020	27 1,258	12 725	27 873	12 482	28 915
8 921	24 948	11 1,020	28 765	13 797	28 770	13 587	29 925
9 967	25 997	12 1,000	29 829	14 881	29 863	14 691	30 932
10 933	26 996	13 1,000	30 817	15 958	30 845	15 780	December
11 966	27 997	14 998	31 809	16 1,000	31 757	16 929	1 946
12 981	28 970	15 945	June	17 1,010	September	17 786	2 944
13 1,000	March	16 968	1 834	18 995	1 801	18 576	3 924
14 988	1 1,000	17 928	2 865	19 992	2 753	19 503	4 924
15 981	2 1,010	18 964	3 879	20 809	3 735	20 573	5 936
16 980	3 1,010	19 960	4 901	21 768	4 743	21 801	6 909
17 983	4 1,030	20 958	5 984	22 716	5 793	22 896	7 918
18 984	5 1,020	21 959	6 992	23 679	6 686	23 947	8 925
19 932	6 948	22 959	7 1,030	24 511	7 631	24 966	9 923
20 953	7 936	23 965	8 1,050	25 576	8 664	25 971	10 1,010
21 952	8 1,010	24 965	9 952	26 512	9 570	26 962	11 911
22 931	9 1,000	25 974	10 997	27 690	10 540	27 945	12 1,010
23 944	10 1,020	26 966	11 868	28 878	11 502	28 941	13 1,020
24 944	11 1,010	27 961	12 551	29 812	12 509	29 923	14 1,010
25 942	12 1,000	28 957	13 778	30 874	13 530	30 907	15 926
26 937	13 981	29 949	14 1,060	31 970	14 566	31 902	16 931
27 936	14 986	30 958	15 1,150	August	15 563	November	17 943
28 952	15 994	May	16 997	1 20	16 601	1 900	18 957
29 958	16 1,010	1 952	17 968	2 1,060	17 605	2 887	19 962
30 972	17 1,010	2 958	18 1,010	3 969	18 602	3 892	20 963
31 977	18 962	3 950	19 1,030	4 826	19 547	4 883	21 966
February	19 1,020	4 952	20 1,020	5 772	20 642	5 892	22 983
1 966	20 1,010	5 982	21 1,040	6 779	21 675	6 881	23 983
2 968	21 1,020	6 974	22 970	7 776	22 713	7 880	24 986
3 948	22 1,020	7 918	23 914	8 790	23 713	8 838	25 989
4 932	23 1,010	8 800	24 910	9 811	24 681	9 858	26 994
5 982	24 1,010	9 848	25 932	10 779	25 699	10 881	27 1,000
6 961	25 1,020	10 989	26 825	11 736	26 726	11 883	28 1,010
7 964	26 1,010	11 1,120	27 425	12 751	27 697	12 869	29 1,010
8 951	27 1,010	12 1,050	28 384	13 771	28 679	13 874	30 1,010
9 961	28 1,000	13 859	29 409	14 773	29 776	14 906	31 1,010
10 956	29 1,010	14 897	30 386	15 766	30 753	15 899	
11 951	30 1,000	15 968	July	16 761	October	16 913	
12 960	31 1,000	16 960	1 423	17 771	1 788	17 906	
13 893	April	17 944	2 476	18 798	2 790	18 888	
14 934	1 976	18 946	3 534	19 810	3 831	19 887	
15 930	2 1,020	19 1,170	4 595	20 803	4 569	20 898	
16 948	3 1,020	20 1,070	5 700	5 443	21 905		

Rio Salado at Las Tortillas, Tamaulipas

January	February	April	June	July	August	September	October
6 656	24 800	1 2,370	5 2,390	12 3,120	8 2,860	11 2,010	20 3,710
10 589	28 1,810	May	14 2,750	15 3,350	13 2,850	21 3,590	30 3,120
30 1,610	March	7 2,770	19 1,470	20 1,750	26 2,470	30 3,750	November
February	4 669	13 2,490	24 2,240	21 1,640	27 1,630	October	5 3,590
2 1,090	11 912	21 2,630	July	22 2,450	30 746	10 3,670	15 3,720
16 1,830	22 2,260	27 2,710	1 2,870	23 844	September	13 3,710	20 3,700
			8 3,050	31 1,450	8 1,560	21 905	28 3,770

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Rio Grande at Falcón Dam-U.S. Tailrace

January	February	April	May	June	August	September	November
2 576	16 600	1 649	8 715	22 750	6 783	18 785	9 787
5 578	18 604	3 655	11 720	24 756	7 781	21 791	13 795
7 577	24 603	6 662	13 720	29 769	10 785	23 788	23 787
9 579	25 602	8 694	15 717	July	11 783	25 791	25 782
14 579	27 607	10 675	17 725	1 771	14 779	28 795	27 785
16 582	March 13	673	20 727	6 773	17 780	30 793	30 783
19 589	3 614	17 678	22 728	8 779	18 786	October	December
21 589	5 625	20 679	25 730	10 772	23 785	2 792	2 782
23 591	9 623	22 678	28 739	13 775	27 783	9 790	7 788
26 597	11 622	24 680	June 15	774	September 12	790	11 783
27 598	13 622	27 694	1 731	17 777	1 781	19 791	14 786
29 596	16 634	29 692	3 734	20 781	3 783	21 789	23 784
February 19	630	May 5	740	23 780	4 785	23 790	25 783
2 592	20 634	1 684	10 735	24 781	8 785	26 800	28 791
4 599	23 646	4 710	12 745	27 789	10 783	28 800	30 786
6 600	25 650	6 715	15 742	29 779	11 786	30 807	
9 598	27 649	19 743	31 777	15 783			
11 600	30 650			16 797			

Rio Grande at Rio Grande City, Texas

January	February	April	May	July	August	October	November
1 928	16 622	1 697	17 755	1 798	16 945	3 809	18 1,420
2 924	17 623	2 712	18 743	2 805	17 884	4 818	19 1,290
3 900	18 627	3 729	19 744	3 801	18 867	5 863	20 1,310
4 870	19 623	4 704	20 745	4 826	19 876	6 846	21 1,300
5 868	20 625	5 712	21 743	5 803	20 854	7 924	22 1,130
6 836	21 625	6 713	22 744	6 807	21 865	8 1,050	23 1,050
7 839	22 625	7 707	23 747	7 800	22 850	9 969	24 972
8 834	23 625	8 722	24 817	8 788	23 835	10 1,020	25 959
9 829	24 626	9 785	25 753	9 785	24 824	11 879	26 989
10 838	25 628	10 784	26 764	10 816	25 596	12 909	27 932
11 820	26 627	11 786	27 778	11 785	26 671	13 917	28 877
12 839	27 633	12 769	28 778	12 780	27 784	14 1,470	29 921
13 830	28 632	13 771	29 820	13 779	28 998	15 718	30 876
14 825	March 14	779	30 866	14 790	29 889	16 746	December
15 634	1 636	15 778	31 869	15 785	30 819	17 929	1 883
16 610	2 641	16 776	June 16	793	31 822	18 970	2 910
17 599	3 637	17 772	1 762	17 797	September 19	965	3 921
18 600	4 644	18 780	2 801	18 807	1 829	20 939	4 898
19 600	5 645	19 775	3 764	19 820	2 828	21 935	5 894
20 613	6 632	20 775	4 750	20 848	3 848	22 1,020	6 880
21 604	7 641	21 765	5 750	21 881	4 809	23 1,070	7 902
22 618	8 640	22 775	6 751	22 850	5 816	24 1,080	8 883
23 603	9 644	23 774	7 754	23 838	6 814	25 963	9 982
24 606	10 644	24 787	8 758	24 822	7 824	26 931	10 1,180
25 602	11 642	25 772	9 757	25 859	8 812	27 973	11 956
26 611	12 651	26 774	10 757	26 890	9 814	28 879	12 887
27 617	13 657	27 785	11 750	27 876	10 803	29 1,020	13 971
28 619	14 650	28 767	12 759	28 881	11 816	30 1,230	14 894
29 607	15 650	29 783	13 758	29 852	12 804	31 1,280	15 880
30 617	16 654	30 787	14 760	30 850	14 830	November 16	915
31 619	17 659	May 15	756	31 866	17 800	1 1,350	17 876
February 18	660	1 787	16 780	August 18	808	2 1,210	18 886
1 616	19 654	2 792	17 967	1 1,130	19 803	3 551	19 824
2 617	20 663	3 797	18 1,300	2 1,190	20 811	4 577	20 810
3 612	21 664	4 792	19 1,240	3 1,140	21 800	5 679	21 802
4 619	22 659	5 780	20 899	4 1,140	22 805	6 1,160	22 814
5 617	23 662	6 791	21 853	5 1,110	23 800	7 809	23 810
6 630	24 662	7 791	22 848	6 923	24 800	8 938	24 805
7 620	25 664	8 776	23 837	7 862	25 858	9 1,350	25 799
8 622	26 668	9 756	24 865	8 1,060	26 806	10 952	26 803
9 624	27 709	10 739	25 889	9 1,030	27 819	11 890	27 799
10 621	28 702	11 742	26 1,200	10 992	28 809	12 886	28 803
11 623	29 703	12 740	27 1,230	11 1,110	29 809	13 882	29 804
12 621	30 699	13 749	28 1,230	12 975	30 808	14 918	30 797
13 621	31 711	14 751	29 832	13 1,010	October 15	932	31 793
14 617	15 745	30 821	14 880	1 803	16 1,150		
15 619	16 744	15 864	2 810	17 1,130			

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Rio Grande near Los Ebanos, Texas

January	February	April	May	July	August	October	November
2 1,160	17 679	3 802	19 763	10 803	25 872	6 860	20 1,780
6 1,090	20 681	7 804	22 769	14 841	28 832	9 1,060	24 1,300
9 1,170	24 701	10 901	26 884	17 842	September	13 1,140	27 1,240
13 1,050	27 696	14 927	29 849	21 901	1 839	16 911	December
16 667	March	17 895	June	24 916	4 813	20 1,020	1 1,160
20 670	3 686	21 902	2 820	28 1,010	8 818	23 1,170	4 1,330
23 673	6 693	24 874	5 809	31 909	11 834	27 1,210	8 994
27 665	10 695	28 864	9 824	August	15 867	30 1,360	11 880
30 670	13 700	May	12 795	4 1,280	18 845	November	15 1,130
February	17 704	1 875	16 816	7 1,100	22 856	3 1,030	18 1,080
3 674	20 695	5 905	19 1,400	11 1,090	25 865	6 1,460	22 862
6 689	24 695	8 837	July	14 987	30 837	10 1,430	25 862
10 688	27 855	12 789	3 867	18 953	October	13 1,110	29 880
13 688		15 784	7 859	21 894	2 815	17 1,710	

Morillo Drain near Reynosa Vieja, Tamaulipas

January	April	May	June	August	September	October	November
10 18,330	2 17,600	13 14,240	25 18,510	12 16,250	14 17,980	22 17,000	13 17,930
February	9 12,700	20 13,850	July	19 13,650	28 14,850	22 14,330	25 17,930
17 17,680	16 15,670	27 9,410	2 14,000	24 13,650	October	22 18,570	December
March	24 13,550	June	16 16,260	31 14,220	5 7,800	22 10,780	2 18,250
5 18,700	25 13,930	10 14,340	August	September	10 17,620	22 16,180	11 18,250
		17 12,890	5 19,690	7 11,920	16 14,810	November	24 18,250
						3 17,320	29 18,580

Rio Grande at Anzaldás Dam

March	April	April	June	July	August	September	November
3 800	3 970	24 1,140	2 1,130	7 1,270	14 1,530	15 1,050	9 2,590
6 779	4 1,240	28 1,280	5 984	10 1,070	18 1,400	21 1,020	16 1,490
10 784	5 1,330	May	9 1,150	14 954	21 1,250	28 1,030	23 2,290
13 774	8 1,260	12 1,020	12 983	17 1,120	25 1,060	October	30 2,290
17 795	8 997	15 1,040	16 977	21 1,200	28 781	5 1,010	December
20 784	10 1,000	19 915	19 1,280	August	September	12 1,610	1 2,020
24 846	14 1,180	22 957	23 1,540	4 1,260	1 1,090	19 1,250	7 2,160
27 808	17 1,230	26 1,200	30 2,120	7 2,040	4 1,000	26 1,250	14 1,820
31 999	21 1,210	29 1,180	July	11 1,490	8 993	November	22 1,050
			3 1,210		11 937	2 1,790	28 968

Rio Grande at Hidalgo, Texas

January	February	April	May	July	August	October	November
13 1,520	25 782	7 1,130	25 995	6 1,260	24 1,200	5 1,010	16 1,490
15 1,560	March	13 1,110	June	13 1,030	31 1,320	12 1,610	23 2,290
19 949	2 782	18 990	1 1,320	20 1,120	September	19 1,250	30 2,290
26 728	9 789	20 1,260	8 1,080	27 1,260	7 1,010	26 1,250	December
February	16 788	27 1,350	15 1,540	August	14 1,150	November	7 1,770
2 772	23 791	May	22 944	3 1,380	21 1,020	2 1,790	14 1,780
9 770	29 978	4 1,140	29 1,470	10 1,810	29 1,030	9 2,590	21 1,490
16 786		11 1,130		17 1,740		28 978	

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1959

Date @25°C	ECx10 ⁶ @25°C								
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Rio Grande at Mercedes, Texas, Pumps

January	February	April	May	July	August	October	November
1 1,420	16 820	2 1,010	19 973	5 1,160	20 1,570	4 986	20 1,600
2 1,380	17 813	3 1,000	20 961	6 1,200	21 1,400	5 1,030	21 1,600
3 1,410	18 832	4 984	21 930	7 1,310	22 1,400	6 989	21 1,620
4 1,380	19 821	5 977	22 940	8 1,280	23 1,360	7 1,110	23 1,580
5 1,440	20 820	6 1,010	23 1,020	9 1,200	24 1,250	8 1,050	24 1,590
6 1,540	21 822	7 983	24 1,060	10 1,110	25 1,240	9 1,060	25 1,610
7 1,540	22 820	8 1,000	25 1,040	11 1,110	26 1,110	10 1,160	26 1,650
8 1,540	23 821	9 1,000	26 980	12 1,070	27 1,050	11 1,220	27 1,740
9 1,660	24 845	10 1,010	27 1,130	13 1,010	28 1,090	12 1,220	28 1,750
10 1,590	25 828	11 1,030	28 1,130	14 996	29 1,030	13 1,360	29 2,310
11 1,520	26 824	12 1,040	29 1,110	15 1,020	30 1,060	14 1,660	30 2,770
12 1,460	27 824	13 1,140	30 1,160	16 1,060	31 1,230	15 1,590	December
13 1,500	28 834	14 1,200	31 1,250	17 1,050	September	16 1,420	1 2,550
14 1,520	March 1,220	June 1,220	18 1,070	1 1,430	17 1,400	2 2,260	
15 1,530	1 823	16 1,210	1 1,250	19 1,110	2 1,200	18 1,490	3 2,060
16 1,520	2 818	17 1,230	2 1,250	20 1,090	3 1,100	19 1,810	4 2,090
17 1,510	3 852	18 1,240	3 1,390	21 1,110	4 1,060	20 1,470	5 2,030
18 1,230	4 809	19 1,230	4 1,210	22 1,110	5 1,010	21 1,350	6 1,700
19 824	5 828	20 1,230	5 1,080	23 1,180	6 999	22 1,450	7 1,420
20 832	6 813	21 1,250	6 1,020	24 1,240	7 1,030	23 1,480	8 1,520
21 815	7 827	22 1,260	7 1,030	25 1,310	8 1,040	24 1,530	9 1,710
22 827	8 813	23 1,290	8 966	26 1,250	9 1,005	25 1,640	10 2,150
23 839	9 811	24 1,270	9 1,040	27 1,260	10 1,010	26 1,480	11 2,010
24 824	10 831	25 1,280	10 1,070	28 1,210	11 964	27 1,420	12 1,670
25 819	11 811	26 1,350	11 1,150	29 1,340	12 941	28 1,370	13 1,800
26 778	12 804	27 1,310	12 1,170	30 1,280	13 978	29 1,370	14 1,550
27 759	13 824	28 1,280	13 1,150	31 1,410	14 963	30 1,880	15 1,800
28 789	14 822	29 1,280	14 1,000	August	15 1,050	31 1,880	16 1,830
29 769	15 813	30 1,300	15 929	1 1,320	16 1,010	November	17 1,880
30 776	16 840	May 16 943	2 1,310	17 1,050	1 2,090	18 1,730	
31 771	17 828	1 1,360	17 983	3 1,430	2 2,230	19 1,250	
February	18 824	2 1,410	18 987	4 1,570	19 1,060	3 2,000	20 1,450
1 765	19 837	3 1,360	19 1,050	5 1,470	20 1,020	4 1,730	21 1,520
2 765	20 821	4 1,420	20 1,350	6 1,450	21 1,000	5 1,460	22 1,450
3 787	21 812	5 1,440	21 1,350	7 1,300	22 1,010	6 2,970	23 1,380
4 796	22 813	6 1,400	22 1,480	8 1,660	23 1,020	8 2,520	24 1,100
5 820	23 814	7 1,300	23 1,430	9 1,900	24 1,040	9 2,320	25 1,090
6 804	24 831	9 2,770	24 1,710	10 2,140	25 1,050	10 2,300	26 1,100
7 839	25 851	10 1,350	25 2,020	11 2,120	26 1,020	11 1,730	27 1,100
8 812	26 852	11 1,300	26 1,770	12 1,810	27 974	12 1,750	28 1,030
9 813	27 851	12 1,160	29 1,430	13 1,650	28 948	13 1,440	29 964
10 836	28 850	13 1,080	30 1,480	14 1,550	29 959	14 1,910	30 985
11 806	29 848	14 1,060	July 15 1,520	30 1,060	15 2,520	31 962	
12 817	30 926	15 1,060	1 1,490	16 1,540	October	16 2,310	
13 816	31 1,000	16 1,100	2 2,760	17 1,800	1 1,050	17 1,920	
14 817	April 17 1,110	3 2,070	18 1,860	2 1,100	18 1,940		
15 826	1 1,010	18 1,060	4 1,210	19 1,880	3 1,070	19 1,470	

Rio Grande near San Benito, Texas

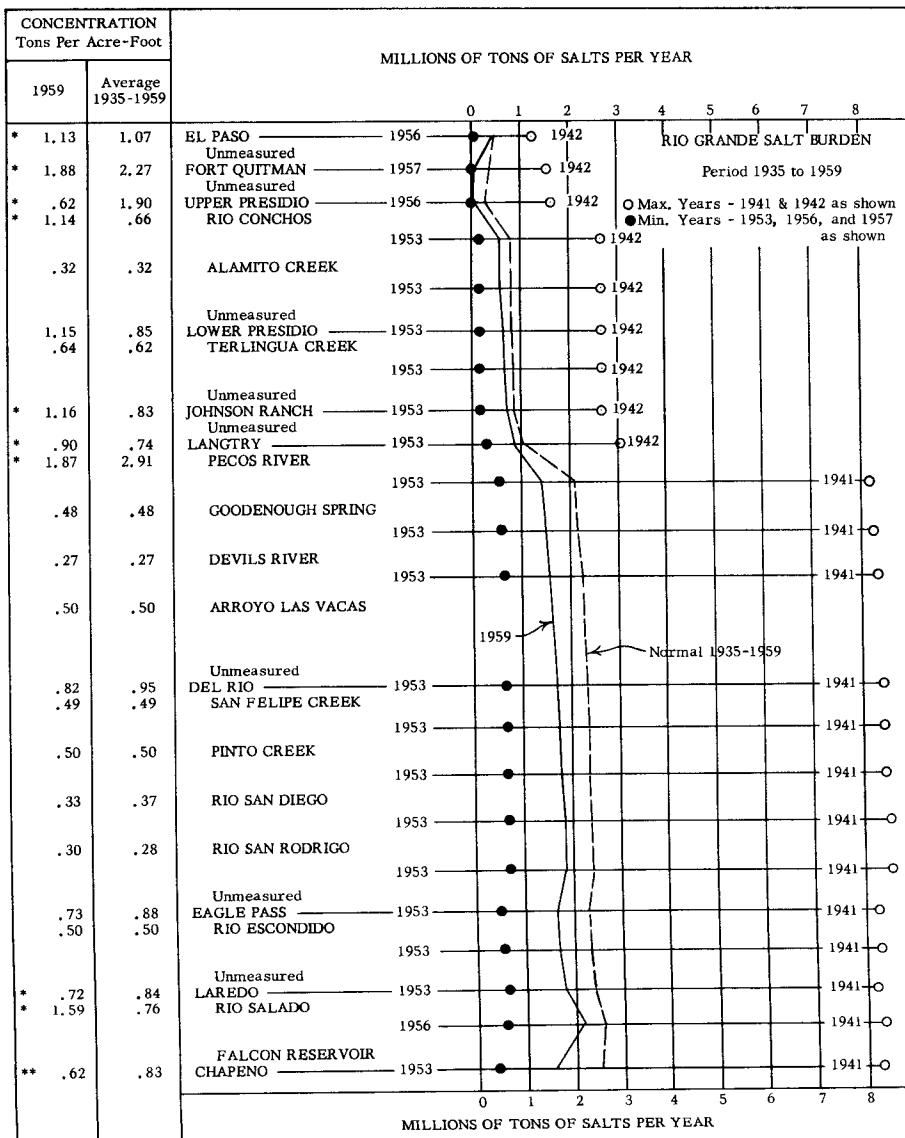
January	February	April	May	July	August	October	November
5 1,440	16 811	6 1,030	25 1,002	6 1,400	24 1,240	5 980	16 2,390
12 1,530	24 824	13 1,120	June 13 1,020	31 994	12 1,180	23 1,640	
19 920	March 20 1,240	1 1,280	20 1,170	September	19 1,380	December	
26 792	2 853	27 1,320	8 1,010	8 1,050	26 1,660	1 2,670	
February	9 815	May 15 958	August	14 973	November	7 1,730	
3 772	19 813	4 1,400	22 1,400	3 1,350	21 1,020	2 2,040	14 1,680
9 808	23 816	11 1,380	29 1,460	10 1,870	28 1,020	9 2,500	22 1,550
		18 1,150	17 1,600			29 999	

Rio Grande at Lower Brownsville, Texas

January	February	April	May	July	August	October	November
5 1,360	16 809	6 1,020	25 1,090	7 1,450	24 1,940	5 1,080	16 1,740
12 1,550	24 833	13 1,030	June 13 1,400	31 1,180	12 1,080	23 1,560	
19 1,520	March 20 1,250	1 1,190	20 1,170	September	19 1,610	December	
26 820	2 841	27 1,320	8 1,090	28 1,420	8 1,250	26 1,480	1 1,700
February	9 828	May 15 1,170	August	14 1,020	November	7 2,520	
3 776	20 836	4 1,380	22 1,090	3 1,460	21 1,120	2 1,450	14 1,680
9 804	23 812	11 1,730	29 1,830	10 1,620	28 1,140	9 1,520	22 1,880
		18 1,360	17 2,050			29 1,210	

RIO GRANDE SALT BURDEN

The term "salt," as used herein, means total dissolved solids. The 1959 concentrations which are marked by an asterisk (*) are based on the chemical analyses shown on preceding pages of this bulletin. Those without asterisks are based on chemical analyses reported in previous water bulletins or have been developed by deduction. Average concentrations shown for the period 1935 to 1959 are the weighted means of the values determined for the 25-year period indicated.



* Based on 1959 chemical analyses of samples collected at stations indicated. ** Based on 1959 chemical analyses of samples collected at Falcon Dam-U. S. Tailrace.

SANITARY ASPECTS OF WATER QUALITY

The United States and Mexican Sections of this Commission and the Texas State Department of Health cooperate in the joint sanitary water-sampling program along the Rio Grande. All analyses below have been made under the "Rules of Laboratory Procedure," as approved by the participating agencies, and which conform with the procedures set out in the manual "Standard Methods for the Examination of Water and Sewage," Tenth Edition (1955), prepared by the American Public Health Association and the American Water Works Association. These analyses were made in the laboratories of the El Paso Water Plant, the Cameron County Health Unit, and the International Boundary and Water Commission. The percentages of dissolved oxygen (D. O.) shown below are the percent saturation at the elevation of the sampling station.

Date 1959	D. O. Percent Saturation	B. O. D. Parts Per Million	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1959	D. O. Percent Saturation	B. O. D. Parts Per Million	Coliform Organisms per 100 c. c. (plate count)	Total Bacteria per c. c. (plate count)
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*Franklin Canal at El Paso, Texas, Water Plant

Jan.	6	114	2.4	11,000	1,085	July	7	94.0	1.2	6,200	8,900	
	13	109	2.7	11,000	635		14	87.2	1.3	22,000	6,300	
	20	101	1.2	70,000	1,025		21	114	1.4	9,400	8,150	
	27	124	1.0	11,000	1,150		28	94.6	1.2	24,000	9,650	
Feb.	3	98.2	2.2	38,000	1,000		Aug. 4	91.9	1.3	24,000	6,600	
	10	121	2.5	11,000	2,150			88.7	1.3	70,000	6,600	
	17	126	2.0	6,200	300			87.7	1.2	240,000+	67,450	
	24	127	3.9					86.5	1.3	70,000	73,300	
Mar.	3	124	4.2	6,200	2,200	Sept.	1	95.5	1.4	70,000	45,650	
	9	105	4.6	9,400	3,350			89.3	1.2	5,500	12,050	
	17	80.4	2.2	6,200	700			101	1.6	24,000		
	24	110	1.1	2,300	800			107	1.3	1,600	2,699	
	31	99.6	1.3	6,200	1,750			102	1.4	140,000	14,790	
Apr.	7	107	1.9	24,000	1,400	Oct.	6			140,000		
	14	108	1.2	1,400	2,050			77.7	1.8	24,000	6,600	
	21	100	1.4	9,400	4,350			85.0	1.5	22,000	40,000	
	28	101	1.7	5,500	1,600			103	1.6	11,000	8,125	
May	5	100	1.5	9,400	3,600			17	62.9	1.0	6,200	5,062
	12	109	1.6	3,600	13,000			113	1.0	38,000	11,000	
	19	99.3	1.3	70,000	6,500			111	2.2	1,600	7,150	
	26	102	1.7	6,200	4,550			107	2.3	9,400	5,700	
June	2	95.8	1.8	3,600	4,700			15	93.8	2.3	16,000	5,900
	9	101	1.1	38,000	19,300							
	16	88.7	1.2	24,000	7,750							
	23	96.7	1.3	38,000	10,050	Total	4,753.5	80.5		1,407,500	461,571	
	30	113	.7	11,000	14,900	Avg.	101	1.7		29,900	10,300	

Rio Grande at Ysleta, Texas-Zaragoza, Chih. Bridge

Jan.	6	52.0	26.8	700,000,000	19,900,000	July	7	66.6	22.4	23,000,000	295,000		
	13	20.8	30.6	700,000,000	11,700,000		14	66.5	12.7	11,000,000	230,000		
	20	0	35.3	2,400,000,000+	13,100,000		21	69.5	11.6	3,600,000	2,840,000		
	27	48.0	24.3	1,400,000,000	10,650,000		28	72.3	18.2	62,000,000	5,920,000		
Feb.	3	67.3	14.3	380,000,000	1,750,000		Aug. 4	68.1	11.5	11,000,000	530,000		
	10	1.9	40.5	700,000,000	8,150,000			71.0	20.0	600,000	27,500		
	17	0	42.7	1,400,000,000	15,800,000			11	14.0	3,600,000	1,440,000		
	24	4.1	54.0					18	67.9	1.4	1,100,000	7,150,000	
Mar.	3	82.8	36.4	700,000,000	1,500,000			Sept. 1	68.0	4.7	1,100,000	1,050,000	
	9	70.0	32.8	24,000,000+	27,000				8	68.1	1.7		
	17	62.9	31.9	23,000,000	80,000				15	77.3	4.0		
	24			36,000,000	87,500				22	75.0	17.2	24,000,000+	
	31	86.4	14.1	36,000,000	44,000				29			110,000,000	
Apr.	7	79.2	37.0	36,000,000	19,000			Oct. 6	104	4.5	59,000,000	12,000,000	
	14	70.3	16.4	6,200,000	80,000				13	8.1	29.1	11,000,000	
	21	68.8	12.1	3,600,000	275,000				20	36.0	2.6	160,000,000	191,000
	28	69.6	6.1	600,000	1,935,000				27	0	4.6	62,000,000	
May	5	75.7	13.9	2,800,000	580,000				Nov. 4	0	2.0	62,000,000	51,000,000
	12	87.9	6.1	3,600,000	2,160,000				10	6.9	1.2	110,000,000	18,100,000
	19	74.6	11.8	2,800,000	735,000				17	15.8	2.9	55,000,000	7,262,000
	26	66.6	30.0	5,400,000	1,250,000				24	62.2	12.8	380,000,000	7,350,000
June	2	81.3	10.6	3,600,000	565,000				Dec. 1	7.7	9.6	280,000,000	4,650,000
	9	81.4	10.2	600,000	2,200,000				8	14.2	11.6	220,000,000	16,600,000
	16	75.2	11.2	5,400,000	510,000				15	9.1	19.3	220,000,000	16,250,000
	23	73.7	25.5	600,000	1,205,000				Total	2,518.1	840.1	10,442,500,000	248,115,750
	30	83.3	27.3	2,300,000	200,000				Avg.	53.6	17.9	222,200,000	\$,514,000

* January samples taken from the Rio Grande at the Water Plant.

SANITARY ASPECTS OF WATER QUALITY

Date 1959	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1959	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)	Date 1959	Coliform Organisms per 100 c. c.	Total Bacteria per c. c. (plate count)
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Rio Grande at Laredo, Texas, Water Plant

Jan.	5	360*	May	18	3,800	2,800	Sept.	21	2,300	7,500
12	2,300	350	25	7,000	33,200	28	3,600		14,200	
19	230	200	June	1	2,400	4,000	Oct.	5	36,000	67,900
26	210	350	8	9,400	7,450			12	6,200	18,800
Feb.	2	110	15	6,200	14,000	19	11,000		27,000	
16	1,100	1,100	22	340	3,550	26	93		600	
24	26	300	29	9,400	40,800	Nov.	2	1,100	1,150	
Mar.	2	360	350	July	6	1,600	4,500	9	38,000	6,200
9	54	400	13	6,200	36,500	16	6,200		2,450	
16	230	300	20	24,000	61,000	23	3,400		1,500	
23	230	450	27	24,000	117,000	30	3,600		2,950	
30	360	550	Aug.	3	2,300	10,000	Dec.	7	3,600	500
Apr.	6	620	450	10	160	1,300		14	620	750
13	620	200	17	540	500	21	60		900	
20	230	350	24	5,500	2,000	28	1,100		400	
27	230	600	31	6,200	50,000					
May	4	1,100	3,100	Sept.	8	16,000	166,000	Total	288,903	771,400
	11	620	3,300		14	38,000	51,000	Avg.	5,660	15,100

Rio Grande at 8.6 Miles Below Laredo, Texas, R. R. Bridge

Jan.	5	6,200	May	18	23,000	115,000	Sept.	21	36,000	180,000
12	6,200	4,500	25	21,000	126,000	28	62,000		138,000	
19	16,000	8,000	June	1	36,000	80,500	Oct.	5	16,000	415,000
26	16,000	7,000	8	21,000	88,500	12	36,000		32,000	
Feb.	2	11,000	15	240,000	130,000	19	36,000		76,000	
16	3,000	22	240,000	375,000	26	3,600			38,000	
24	23,000	10,500	29	23,000	292,000	Nov.	2	94,000	141,000	
Mar.	2	36,000	9,500	July	6	380,000	75,000	9	21,000	52,500
9	13,000	6,000	13	21,000	65,000	16	62,000		15,500	
16	16,000	11,000	20	240,000	156,000	23	94,000		30,000	
23	36,000	30,500	27	110,000	82,000	30	16,000		40,500	
30	62,000	26,000	Aug.	3	240,000	498,000	Dec.	7	21,000	22,500
Apr.	6	160,000	10,000	10	380,000	343,000		14	36,000	50,500
13	62,000	32,000	17	240,000	26,000	21	16,000		41,500	
20	110,000	8,000	24	110,000	26,000	28	16,000		20,000	
27	110,000	56,000	31	36,000	359,000					
May	4	36,000	55,000	Sept.	7	160,000	222,000	Total	3,939,000	4,825,000
	11	110,000	110,000		14	23,000	75,000	Avg.	78,800	96,500

Rio Grande at Falcón Dam-U.S. Tailrace

Jan.	5	3	250	May	11	5	300	Aug.	31	34	600
12	16	600	18	16	100	100	Sept.	7	9	250	
19	11	350	25	6	400	400		14	36	550	
26	21	200	June	1	9	400	28	62		350	
Feb.	2	0	450	8	230	1,200	Oct.	5	230		1,350
16	0	100	15	11	350			12	54		450
Mar.	2	6	450	22	280	300		26	3		400
9	34	350	29	14	1,900		Nov.	2	21		400
16	16	500	July	6	210	1,000		9	93		200
23	11	500	13	93	550			16	360		500
30	3	350	20	160	900			23	110		300
Apr.	6	6	300	27	58	200		30	80		500
13	36	450	Aug.	3	37	300		7	93		150
20	11	200	10	36	1,570			14	62		750
27	3	800	17	2,800	900						
May	4	16	650	24	130	450	Total		5,535		24,070
							Avg.		120		523

Rio Grande at Mercedes, Texas, Pumps

Jan.	5	2,300	May	11	6,200	Sept.	14	1,600		
12	2,300	18	11,000	26	6,200	22	1,100			
20	3,600	26				28	2,300			
26	38,000	June	1	360		Oct.	5	24,000		
Feb.	3	13,000	8	3,600			13	1,100		
9	1,100	15	6,200				19	930		
16	11,000	22	3,400				26	1,600		
24	1,100	29	3,600				Nov.	2	620	
Mar.	3	620	13	3,600				9	3,600	
9	1,100	20	2,600					16	1,100	
16	360	27	2,300					23	1,600	
23	930	Aug.	3	2,300				30	1,600	
30	1,300	11	9,400					7	2,300	
Apr.	6	2,300	17	3,400				14	3,400	
13	670	24	3,600					21	3,600	
20	3,400	31	6,200					28	930	
28	11,000	Sept.	8	1,600			Total		229,520	
May	4	2,300					Avg.		4,410	

RAINFALL ON THE RIO GRANDE WATERSHED
IN INCHES
In the United States

Tabulated below, in downstream order, are monthly records of United States rainfall stations with averages for their periods of record. For location, elevation, period of record, type of gage in use, watershed subdivision in which the station is located, and the observer, see alphabetical listing of these stations shown on pages 104 through 106 of this bulletin. These rainfall records have not been published elsewhere. Records of daily rainfall amounts, where available, are on file in the office of the United States Section of this Commission. Daily records for years prior to 1953 may also be found in corresponding water bulletins.

Detailed listings of the months and years for which records are available through 1956 may be found under "Index to Precipitation Records" in Water Bulletins 10, 14, 22 and 26.

Month	American Dam		Island Station		Fabens-Guadalupe Bridge		County Line		Fort Hancock Bridge	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.03	.42	.01	.35	.14	.37	.11	.39	.09	.40
Feb.	T	.38	0	.29	0	.30	0	.21	T	.27
Mar.	.07	.38	0	.28	0	.31	0	.30	0	.25
Apr.	.04	.24	0	.21	.02	.29	.02	.27	.06	.34
May	.07	.29	.58	.42	.14	.42	0	.43	1.88	.67
June	.18	.66	.24	.54	.15	.49	1.27	.56	.53	.82
July	.39	1.47	.53	.98	.46	1.16	.23	1.00	.31	1.16
Aug.	2.39	1.47	1.58	1.23	.26	1.33	.89	1.36	1.79	1.62
Sept.	T	.93	.21	.84	.25	.99	0	.98	.02	.91
Oct.	.44	.70	.34	.89	.60	1.01	.90	1.00	.80	1.11
Nov.	.15	.18	.20	.21	.28	.21	.36	.21	.62	.22
Dec.	.27	.38	.33	.34	.19	.37	.05	.33	.07	.39
Yearly	4.03	7.50	4.02	6.58	2.49	7.25	3.83	7.04	6.17	8.16

Month	Madden Arroyo		Guayucco Arroyo		Fort Quitman		Neely Ranch		Moody Bennett	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.03	.30	.14	.36	.19	.45	0	.38	.08	.29
Feb.	0	.18	0	.19	0	.25	0	.17	.12	.73
Mar.	0	.15	0	.18	0	.24	0	.19	0	.12
Apr.	.12	.34	.05	.24	.15	.31	.12	.13	0	.19
May	.04	.54	.17	.40	1.01	.45	.30	.42	.77	.90
June	.31	.50	1.02	.52	.65	.74	1.09	.61	.29	.12
July	.26	1.17	.61	1.47	.46	1.44	.75	1.50	.51	.93
Aug.	1.40	1.64	1.58	1.60	1.38	1.47	1.42	1.58	1.32	1.08
Sept.	.04	.88	.10	.15	.04	.96	.24	1.35	0	.88
Oct.	.32	1.20	1.52	1.27	.80	.91	.54	1.11	.42	1.00
Nov.	.34	.14	.91	.18	.86	.27	1.29	.19	.66	.24
Dec.	0	.34	.03	.35	.06	.32	.05	.33	.50	.19
Yearly	2.86	7.38	6.13	7.91	5.60	7.81	5.80	7.96	4.67	6.67

Month	Bill Shannon		Adobes Ranch		Livingston Ranch		Presidio (IB&WC Gage)		Quebec Ranch	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	T	.68	0	.35	0	.66	0	.27	0	.48
Feb.	0	.88	.40	.28	.75	.48	.30	.24	.45	.29
Mar.	0	.23	0	.18	0	.08	0	.17	0	.28
Apr.	0	.12	.40	.20	.50	.15	.40	.20	.50	.40
May	0	.48	.72	.40	.50	.35	1.30	.40	2.70	1.30
June	2.00	.77	.95	1.01	.90	1.07	.90	.80	2.50	1.66
July	1.00	1.01	.15	1.83	.60	1.04	.30	1.10	.90	2.12
Aug.	.95	1.61	.62	1.04	3.40	1.33	.90	.80	2.50	1.71
Sept.	.75	1.56	T	1.59	0	.91	1.20	.94	.75	1.53
Oct.	.60	1.24	.56	.75	.60	1.19	.50	.56	.45	.96
Nov.	0	0	.39	.16	.75	.25	.60	.16	.95	.25
Dec.	0	.08	.60	.15	.75	.22	.30	.15	.20	.22
Yearly	5.30	8.66	4.79	7.94	8.75	7.73	6.70	5.79	11.90	11.20

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Month	Kelly Ranch		Blois Camp		Marfa Experiment Station		Kerr Mitchell Ranch		Loma Vista Ranch	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	0	.48	.21	.62	0	.56	0	.58	.10	.84
Feb.	.40	.23	.88	.67	.65	.47	.56	.39	.04	.42
Mar.	0	.25	0	.46	0	.30	0	.20		.18
Apr.	.50	.59	.93	.56	1.42	.44	.56	.56		.69
May	1.85	1.24	1.94	1.74	.71	.88	.27	1.07		.97
June	2.65	1.78	4.06	2.59	1.95	1.63	5.09	1.81	1.70	1.74
July	2.50	3.30	1.04	3.03	1.00	2.06	1.81	1.88	2.60	2.28
Aug.	4.70	2.03	6.78	3.65	4.96	1.64	.98	1.75	2.65	1.59
Sept.	.40	2.37	.94	2.64	.57	1.27	1.08	1.53		1.54
Oct.	.90	.86	1.52	1.62	.57	.80	.53	1.32		1.24
Nov.	1.40	.20	.89	.41	.86	.13	.55	.21		.30
Dec.	.35	.26	.71	.54	.75	.23	.65	.40		.46
Yearly	15.65	13.59	19.90	18.53	13.44	10.41	12.08	11.70		12.25

Month	H. T. Fletcher Ranch		Sauz Ranch		McFarland Ranch-Shannon		McFarland Ranch-Cement		McFarland Ranch-Headquarters	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	0	.93	0	.75	0	1.50	0	1.47	0	1.07
Feb.	.60	.34	.40	.31	.68	1.61	.70	1.70	.70	.68
Mar.	.40	.36	.35	.50	0	.32	0	.30	0	.37
Apr.	.70	.56	.50	.33	.85	.24	.85	.29	.85	.58
May	.55	1.20	.45	1.19	.45	.69	.40	.76	.20	1.25
June	2.15	1.38	2.60	1.33	4.25	1.91	4.25	1.80	3.60	1.27
July	2.55	2.76	.70	2.70	3.55	3.48	3.40	3.20	3.90	3.35
Aug.	4.25	2.84	3.75	2.30	2.95	3.05	2.85	3.11	2.45	2.57
Sept.	1.10	1.74	.85	2.00	0	2.70	0	2.40	0	2.17
Oct.	.95	1.51	.90	1.53	0	2.54	0	2.41	0	1.70
Nov.	.85	.31	.45	.29	.80	.61	.80	.62	.80	.46
Dec.	.40	.35	.45	.44	1.05	.34	1.05	.33	1.05	.55
Yearly	14.50	14.28	11.40	13.67	14.58	18.99	14.30	18.39	13.55	16.02

Month	McFarland Ranch-Casa Colorado		McFarland Ranch-Deep Well		McFarland Ranch-Cane Pasture		McFarland Ranch-Punta el Agua		McFarland Ranch-Cocameca	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	0	1.44	0	1.50	0	1.38	0	1.44	0	1.37
Feb.	.72	1.67	.75	2.08	.72	1.70	.70	1.61	.70	2.70
Mar.	0	.31	0	.32	0	.28	0	.27	0	.51
Apr.	.85	.34	.85	.30	.85	.32	.85	.33	.85	.47
May	.20	.75	.20	.69	.90	1.01	1.50	.97	.15	1.01
June	3.75	1.56	3.65	1.96	4.35	1.79	4.75	1.68	5.00	2.70
July	2.00	2.63	3.70	3.09	1.85	2.39	2.15	2.22	3.90	3.35
Aug.	2.30	3.27	2.80	3.30	2.05	2.54	.90	2.39	2.80	3.33
Sept.	0	1.98	0	2.48	0	2.11	0	1.82	0	3.38
Oct.	0	2.23	0	3.35	0	2.26	0	2.14	0	2.47
Nov.	.80	.56	.80	.63	.80	.53	.80	.52	.80	.63
Dec.	.85	.30	1.05	.32	1.05	.33	1.10	.34	1.05	.40
Yearly	11.47	17.04	13.80	20.02	12.57	16.64	12.75	15.73	15.25	22.32

Month	L. T. Van Eman Ranch		H. M. Greenwood (Clenega Ranch)		Redford		Lajitas Ranch		O2 Ranch	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	0	.60	0	.62	0	.45	0		0	.55
Feb.	.35	.20	.68	.26	0	.27	.37		.76	.43
Mar.	0	.30	0	.20	0	.10	0		0	.38
Apr.	.57	.43	.80	.63	.80	.24	.18		.72	.39
May	2.51	.85	2.30	.87	.90	.41	1.87		1.46	1.18
June	5.59	1.94	1.82	1.60	.70	.38	1.52		1.73	1.27
July	.99	1.88	2.26	1.75	.10	.19	.52		.66	1.63
Aug.	2.93	2.20	2.46	1.72	.70	.74	.30		3.10	2.54
Sept.	1.14	1.83	.17	2.24	1.30	1.65	.27		.74	1.69
Oct.	.90	.95	1.68	1.36	.70	.78	.78		1.27	1.73
Nov.	.78	.29	.80	.29	.60	.22	.31		.50	.61
Dec.	.50	.40	.71	.52	.10	.07	.09		.10	.35
Yearly	16.26	11.87	13.68	12.06	5.90	5.50	6.21		11.04	12.75

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Month	Terlingua Creek Station		Maverick Ranger Station		Johnson Ranch		Buttrill Ranch		Maravillas Gap Ranch	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	0	.26	0	.57	0	.42	0	.65	0	.97
Feb.	0	.14	.17	.37	0	.16	.50	.40	.60	.82
Mar.	0	.16	0	.06	0	.17	0	.13	0	.16
Apr.	.50	.53	.31	.12	.40	.53	.80	.66	.72	.42
May	.30	.51	.70	.74	.20	.93	2.00	1.12	1.18	1.00
June	.50	.63	2.38	1.07	.30	1.04	1.00	.86	1.39	1.12
July	.90	.68	1.23	1.41	.40	1.15	2.11	1.16	.57	.72
Aug.	0	.43	1.87	.71	0	.78	0	.42	0	1.11
Sept.	.25	.55	.29	1.06	.20	1.18	.40	.88	.30	.71
Oct.	.65	.60	.74	.94	.90	.60	.86	.89	.94	1.60
Nov.	.75	.16	1.05	.27	.40	.20	.60	.31	.68	.17
Dec.	.20	.18	.34	.17	.10	.29	.40	.07	.25	.14
Yearly	4.05	4.83	9.08	7.49	2.90	7.45	8.67	7.55	6.63	8.94

Month	Ray Willoughby Ranch		J. F. Woodward Ranch		A. M. Potter Ranch		Sand Valley Ranch		Persimmon Gap Ranger Station	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	0	.52	.08	.63	0	.28	0	.62	0	.41
Feb.	.60	.59	.47	.63	2.10	.72	.50	.36	.49	.40
Mar.	0	.32	0	.16	0	.03	0	.21	0	.14
Apr.	.50	.46	.46	.69	1.15	.39	.60	.29	.66	.46
May	1.90	1.16	1.26	1.17	2.95	.94	1.25	1.02	3.38	1.00
June	2.45	1.72	1.58	1.58	3.30	1.12	.50	1.04	1.13	1.13
July	5.10	2.97	3.58	1.73	2.45	1.36	1.75	1.59	.89	1.10
Aug.	3.50	2.24	4.28	2.50	2.90	1.25	1.20	.47	.53	.50
Sept.	1.80	2.46	1.18	1.80	3.80	1.83	0	1.13	.28	.98
Oct.	1.90	.91	1.45	1.10	0	.18	.80	.72	.50	.76
Nov.	1.10	.26	.69	.19	1.45	.61	.75	.32	.79	.21
Dec.	.70	.16	.43	.16	2.75	.48	.25	.24	.25	.16
Yearly	19.55	13.77	15.46	12.34	22.85	9.19	7.60	8.01	8.90	7.25

Month	Black Gap Game Refuge		Dove Mountain Ranch		Garner Ranch		Steve Stumberg Ranch		McConagill Ranch Headquarters	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.39	.42	0		0	.49	0	.64	0	.44
Feb.	.60	.53	.80		.39	.29	.40	.43	.50	1.10
Mar.	0	.25	0	.25	0	.15	0	.23	0	.38
Apr.	.98	.47			.53	.50	u .90	.73	0	.42
May	4.40	1.34	4.63	1.45	.92	1.00	u 1.60	1.59	1.40	.85
June	1.30	.74	.60	.91	.51	.91	2.35	1.20	.30	1.46
July	1.30	1.03	3.45	1.26	.80	.73	u 6.43	1.96	3.40	1.53
Aug.	2.09	.72			.85	.90	u 1.95	1.25	1.67	1.27
Sept.	.26	1.24	2.80	1.20	1.52	1.15	u 1.25	2.04	2.43	1.62
Oct.	1.68	.84			.92	1.21	u 4.12	1.42	1.30	.72
Nov.	.72	.26			.85	.17	.80	.42	0	.21
Dec.	.36	.29	.44	.28	.26	.13	.60	.63	0	.12
Yearly	14.08	8.13			7.55	7.63	20.40	12.54	11.00	10.12

Month	McConagill Ranch East Mill		Arvin and Harkins Header		Arvin and Harkins Bean		Arvin and Harkins Camel		Arvin and Harkins Headquarters	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	0	.42	0	.52	0	.55	0	.42	0	.55
Feb.	.50	.20	0	.53	0	.47	0	.47	0	.51
Mar.	0	.52	0	.35	0	.36	0	.37	0	.33
Apr.	0	.68	1.10	1.40	1.20	1.35	1.20	1.33	.90	1.19
May	2.50	.86	5.70	1.79	4.00	1.46	2.50	1.28	3.00	1.60
June	.30	1.22	1.10	1.34	1.00	1.29	.90	1.14	.90	1.14
July	3.30	1.22	4.20	1.08	4.10	1.13	2.30	.83	2.20	.86
Aug.	.90	.93	.20	1.22	1.30	1.54	.20	.81	.40	1.10
Sept.	2.70	2.11	2.00	2.05	2.30	1.63	1.40	1.36	.90	1.20
Oct.	2.10	.94	4.10	1.75	1.50	1.63	4.70	1.49	4.30	1.60
Nov.	0	.24	1.00	.33	1.50	.33	1.20	.28	1.60	.31
Dec.	0	.29	.60	.27	.60	.30	.50	.27	.70	.28
Yearly	12.30	9.63	20.00	12.63	17.50	12.04	14.90	10.05	14.90	10.67

^u Estimated

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Month	Arvin and Harkins Monty Corder		E. W. Hardgrave Ranch		Adams Bros. Ranch		Bricker Ranch		Dryden	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	0	.60	0	.66	0	.55	0	.44	0	.60
Feb.	0	.55	.54	.71	.75	.59	.88	.57	.71	.47
Mar.	0	.38	0	.33	0	.30	0	.35	0	.37
Apr.	1.40	1.34	.82	1.04	1.53	.92	.52	1.29	.80	.88
May	3.30	1.34	1.88	1.73	2.84	1.57	1.16	1.66	1.16	2.02
June	.80	1.37	2.57	1.37	.60	1.15	3.33	1.65	2.07	1.04
July	4.10	1.04	4.10	.87	5.04	.94	1.33	.36	1.45	1.01
Aug.	.20	.70	.37	.75	.15	.64	.45	.38	.35	1.17
Sept.	.30	1.32	3.08	1.71	1.18	2.53	1.36	1.65	.56	1.74
Oct.	4.60	1.49	4.60	1.70	2.83	1.47	1.55	1.21	2.51	1.21
Nov.	1.10	.31	.89	.43	.80	.36	.73	.32	.68	.37
Dec.	.70	.27	.55	.23	.44	.20	.51	.21	.25	.47
Yearly	16.50	10.71	19.40	11.53	16.16	11.22	11.82	10.09	10.54	11.35

Month	Cedar Service Station		Pumpville		C. L. Arthur Ranch		Hoffman Ranch		Ingram Ranch	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	T	.70	0	.47	0	.93	0	.69	0	.84
Feb.	2.00	1.09	1.01	.47	.95	.48	.72	1.02	.55	.70
Mar.	0	.28	.12	.41	0	.31	0	.27	0	.50
Apr.	.52	.65	.35	1.15	.43	.41	.75	.44	.57	1.00
May	1.63	2.92	.84	1.86	.97	1.32	1.72	1.09	1.30	3.30
June	2.21	1.71	2.07	1.62	2.05	1.61	.75	1.09	4.38	2.50
July	1.39	.67	1.11	.39	1.96	2.50	2.09	1.96	2.95	.94
Aug.	1.32	.99	0	.40	2.85	2.05	2.49	1.88	.75	.37
Sept.	.79	1.74	0	1.62	.37	1.48	.91	1.42	0	2.10
Oct.	1.46	1.35	.12	1.31	.54	.96	.42	1.07	.97	1.81
Nov.	.71	.62	1.05	.21	.57	.32	.45	.37	0	.34
Dec.	.48	.24	.95	.52	.59	.22	.60	.25	1.30	.44
Yearly	12.51	12.96	7.62	10.43	11.28	12.59	10.90	11.55	12.77	14.84

Month	Shumla Bend		Martin King Ranch		Comstock		Goodenough		Lucius Hinds Ranch	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	0	.62	T	.69	.10	.72	T		0	.83
Feb.	.80	.71	.56	.62	1.04	.83	.23		0	.96
Mar.	0	.30	0	.12	0	.68	0		.60	.55
Apr.	.60	.98	.87	.91	1.26	1.55	.92		1.47	1.36
May	.66	3.05	.75	2.42	3.61	2.24	2.02		2.70	2.71
June	6.73	1.98	3.13	1.22	5.02	2.30	2.48		1.80	1.68
July	1.59	.38	2.05	.52	2.24	.92	1.20		1.90	.46
Aug.	.70	1.63	.59	.60	.75	1.85	.33		1.64	1.23
Sept.	.05	1.53	.93	2.35	1.73	1.83	.10		3.58	1.88
Oct.	1.42	1.61	3.02	2.14	6.37	1.67	6.75		5.64	2.47
Nov.	.63	.48	.93	.58	1.24	.57	.45		1.55	.75
Dec.	.93	.29	.80	.29	1.01	.78	.50		.78	.51
Yearly	14.11	13.56	13.63	12.46	24.37	15.94	14.98		19.90	15.39

Month	Devils Lake		Wardlaw Ranch		Amistad Damsite		H. T. Miers Ranch			
	1959	Average	1959	Average	1959	Average	1957	1958	1959	Average
Jan.	.07	.72	.04	.87	T	.56	.30	3.00	0	1.10
Feb.	.82	.81	.81	1.00	.28	.61	2.20	3.10	1.00	2.10
Mar.	T	.69	0	.34	0	.36	2.90	.80	0	1.23
Apr.	1.58	1.73	1.49	1.39	1.07	.97	7.00	.70	2.80	3.50
May	6.26	2.03	4.20	3.36	4.35	2.68	8.30	2.00	5.20	5.17
June	8.07	2.49	5.61	3.06	4.92	1.69	1.20	8.40	7.40	5.67
July	1.57	.83	2.19	.80	1.63	.55	0	1.20	4.60	1.93
Aug.	1.47	1.27	1.01	1.42	.59	.76	0	1.40	.80	.73
Sept.	.40	1.69	.12	2.08	1.35	2.15	3.60	9.70	.90	4.73
Oct.	6.31	1.82	4.12	2.40	4.10	2.71	2.30	5.90	5.40	4.53
Nov.	.96	.64	.74	.69	.25	.54	2.90	.50	.60	1.33
Dec.	.99	.71	.67	.35	.62	.24	.70	0	1.50	.73
Yearly	28.50	15.43	21.00	17.76	19.16	13.82	31.40	36.70	30.20	32.75

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Month	Armistead Ranch		Maverick County Canal Headgate		Pinto Creek		Las Morras Creek		Wipff Ranch	
	1959	Average	1959	Average	1958	1959	1959	Average	1959	Average
Jan.	.18	.75	0	.49	Record began December 1958	.10	0	1.22		
Feb.	1.16	1.13	.30	1.16	T	1.07	1.68			
Mar.	.01	.95	0	.64		.25	.45	.65	0	
Apr.	3.55	2.08	2.93	1.74		1.60	.71	.68	.20	
May	5.22	2.81	2.25	2.44		2.20	2.67	3.10	3.30	
June	6.05	4.24	11.77	2.48		12.40	7.14	9.73	6.70	
July	2.00	1.02	2.91	1.81		2.80	1.97	1.84	1.90	
Aug.	2.00	1.91	.20	1.41		.10	.72	.78	.75	
Sept.	.50	3.81	.95	2.45		.80	.70	4.37	.80	
Oct.	5.90	3.18	2.42	1.82		2.90	3.10	3.98	2.52	
Nov.	1.00	.85	.62	.48		1.10	1.53	.99	.90	
Dec.	1.66	.51	.44	.50	.20	.30	.50	.48	.24	
Yearly	29.23	23.24	24.79	17.42		24.55	20.56	29.50		

Month	Lateral No. 2 Spill		Normandy		Lateral 12 Headgate		Lateral 15 Spill		Maverick Power Plant	
	1959	Average	1958	1959	1959	Average	1959	Average	1959	Average
Jan.			Record began December 1958	.14	.10		.07		.19	.72
Feb.				.44	.25		.35		.35	.67
Mar.	0		0	0		0			T	.99
Apr.	.30			.65	.25		.20		.40	1.50
May	1.98		2.05	3.95		2.25		2.52	2.67	
June	6.20		5.79	4.80		4.65		5.21	2.95	
July	1.75		2.27	1.25		2.60		2.55	1.12	
Aug.	.35		.31	.60		.40		.28	1.54	
Sept.	.75		.89	.65		.55		.48	2.67	
Oct.	2.80		2.87	4.38		3.95		4.25	2.34	
Nov.	.75		1.69	.72		.68		.69	.67	
Dec.	.37		.54	.32	.30	.35		.34	.44	
Yearly				17.42	17.25		16.05		17.26	18.28

Month	Cooper Ranch		Chittim Ranch		Coal Mine		Elm Creek		Tortuga Ranch	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.					0		.10		0	.49
Feb.			0				.14		.60	.45
Mar.	0		1.65		0		T		0	.41
Apr.	.40		1.65		.47		.50		1.60	1.70
May	3.23		3.80		2.90		2.77		3.90	3.55
June	3.90		2.00		4.22		2.00		2.20	1.19
July	4.80		6.20		6.75		6.70		7.25	1.58
Aug.	.80		.75		.81		.75		1.20	2.38
Sept.	.50		.60		.69		.43		.25	3.07
Oct.	5.15		6.50		4.99		4.98		6.30	2.03
Nov.	.75		.66		.66		.55		.30	.38
Dec.	.42		.40		.33		.35		.30	.37
Yearly							19.27		23.90	17.60

Month	Rosita Creek Siphon		Trees Farm		Rosita Creek		Farias Ranch		Indio Ranch	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.30				.20				.43	
Feb.	.52				.20				.71	
Mar.	.08		0		.02		0		0	
Apr.	1.50		.86		1.00		.96		1.22	
May	3.46		3.45		2.35		2.69		2.45	
June	2.73		2.60		2.40		4.66		3.71	
July	4.08		5.18		4.30		.95		2.51	
Aug.	.88		1.49		1.90		1.08		3.91	
Sept.	.35		.15		.35		.86		.93	
Oct.	7.00		6.27		7.25		6.80		4.25	
Nov.	.63		.55		.72		1.21		1.72	
Dec.	.35		.35		.45		.35		.57	
Yearly	21.88				21.14				22.41	

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Month	El Indio		Van Dalsem Farm		Wuensche Farm		Keisling Farm		Cuervo Creek	
	1959	Average	1959	Average	1959	Average	1958	1959	1959	Average
Jan.	.45	.87	.80		.25	.77	Record began December 1958	.65	.30	.97
Feb.	.87	.84	.17		.92	1.12		.40	.42	.80
Mar.	0	.56	0		T		0	T	.18	
Apr.	.95	1.31	1.12		1.42	1.54	1.25	u	1.35	1.38
May	2.75	3.43	3.21		3.35	2.77		3.05	3.62	2.44
June	5.80	1.81	4.48		4.38	1.50		1.65	3.10	1.86
July	.95	.65	1.60		2.45	1.01		1.57	.90	.92
Aug.	1.85	2.15	1.40		1.38	1.45		.82	1.80	1.88
Sept.	.15	2.99	.80		.31	3.01		1.23	2.20	3.28
Oct.	4.35	1.57	2.35		1.21	1.62		.95	1.50	1.86
Nov.	1.47	.59	.98		.79	.66		.30	1.60	.78
Dec.	.30	.68	.50		.50	.48	.79	.85	.50	.45
Yearly	19.89	17.45	17.41		16.96	16.49		12.72	17.29	16.80

Month	Apache Ranch		Justapor Ranch		J. W. Nixon Ranch		Laredo Water Plant		Fort McIntosh		
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average	
Jan.	.50	1.43	.70	.73			Record began August 1959	.65	.88	.71	.75
Feb.	2.90	1.44	2.50	1.70				1.95	.79	2.15	.86
Mar.	0	.07	.02	.20				.01	.58	T	.73
Apr.	0	1.09	.15	1.91				.86	1.05	.87	1.30
May	2.20	2.78	1.50	2.39				.58	2.52	.62	2.66
June	5.50	1.41	2.50	1.03				2.67	2.04	2.41	2.07
July	3.10	2.12	2.25	.59				1.87	1.30	1.37	1.48
Aug.	.50	2.16	2.10	1.20	.30			1.79	1.53	2.35	1.75
Sept.	0	3.73	2.27	2.03	.55			.13	2.83	.12	2.73
Oct.	5.70	3.71	.60	1.85	.25			.92	1.68	1.46	1.68
Nov.	0	.81	2.20	1.34	1.28			1.16	.81	1.17	1.14
Dec.	.25	.72	.40	.83	.37			.16	.92	.16	.85
Yearly	20.65	21.47	17.19	15.80				12.75	16.93	13.39	18.00

Month	Corralitos Ranch		Huisache Ranch		Zapata Water Plant		Arroyo Tigre Chiquito		Falcón Dam	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.80	.91	.90	1.38	1.01	1.31	.90	1.32	1.29	.88
Feb.	1.30	.60	1.90	.90	1.98	.82	2.60	1.28	2.24	.79
Mar.	.10	.19	.10	.44	0	.47	.10	.26	.13	.91
Apr.	.30	.79	.40	.75	.44	.96	.60	1.21	.58	1.13
May	.50	1.32	0	1.43	0	2.52	1.20	1.64	.16	2.17
June	13.50	2.88	5.20	2.10	2.25	1.48	1.70	1.88	4.15	2.47
July	.50	.85	3.90	1.48	2.50	.84	2.20	.90	1.39	.65
Aug.	.20	1.83	.90	1.40	1.01	1.73	1.60	1.14	1.74	2.29
Sept.	1.10	1.85	.82	2.18	2.44	2.84	3.00	2.85	2.71	2.38
Oct.	1.90	2.10	1.40	2.76	1.64	2.04	1.49	2.32	2.01	2.38
Nov.	.70	.57	.60	.85	.75	.86	4.01	1.55	4.74	1.17
Dec.	.10	.21	.10	.36	.11	.34	.10	.30	.17	.33
Yearly	21.00	14.10	16.22	16.03	14.13	16.21	19.50	16.65	21.31	17.55

Month	Roma		Garciasville		Los Ebanos		La Joya		HCWCID #6	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	2.68	1.00	.55	2.21	.40	2.40	.55	2.84	1.20	1.15
Feb.	1.99	1.04	1.75	1.90	1.17	1.56	1.85	1.81	1.79	1.16
Mar.	.19	.91	0	.06	.29	.30	.08	.14	.02	.56
Apr.	.51	1.28	.40	1.48	.40	2.48	.40	1.56	1.57	1.33
May	.08	1.79	.10	1.42	.38	.88	.50	1.21	.11	1.48
June	2.49	2.17	2.05	2.28	.37	1.80	.96	1.53	1.08	1.35
July	0	.89	1.35	1.09	.41	.40	.15	.25	.18	.51
Aug.	1.88	2.08	1.95	.76	.82	1.01	.69	1.13	.65	1.49
Sept.	4.47	3.50	.20	1.33	.22	1.28	.75	1.32	.71	2.11
Oct.	1.05	2.59	1.20	3.61	.40	2.97	1.13	3.16	3.52	3.58
Nov.	.60	.60	1.21	1.22	.63	1.30	2.04	1.67	1.07	1.01
Dec.	0	.34	.20	.29	.20	.20	.19	.36	0	.44
Yearly	15.94	18.19	10.96	17.65	5.69	16.58	9.29	16.98	11.90	16.17

^u Estimated

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Month	Penitas		Mission Pump		O. C. Dale Farm		HCWCID #15		Edinburg Filtration Plant	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.54	2.62	1.69	1.03	1.67	1.64	1.19	1.46	1.08	1.56
Feb.	1.79	2.04	2.27	1.24	2.51	1.35	2.15	1.12	2.48	1.19
Mar.	0	.34	.15	.73	.11	.58	.09	.79	.15	.69
Apr.	.57	.28	1.60	1.33	^u 2.38	1.78	4.77	1.72	.93	1.80
May	.79	1.04	.05	1.21	0	1.32	T	1.24	0	1.25
June	.42	.89	1.11	1.90	1.88	2.18	.78	1.85	2.02	1.92
July	0	.42	.37	.89	1.18	.95	0	.75	1.02	.80
Aug.	.22	.49	1.07	1.50	2.02	1.33	3.47	1.45	.22	.97
Sept.	.76	1.59	0	1.45	.06	2.23	.22	2.32	.33	2.07
Oct.	2.13	4.19	3.46	3.63	4.68	3.53	3.41	2.77	2.38	2.85
Nov.	.89	1.17	.72	1.02	1.88	1.34	.86	.95	1.97	1.22
Dec.	.15	.62	0	.70	.16	.69	.23	.66	.16	.62
Yearly	8.26	15.69	12.49	16.63	18.53	18.92	17.17	17.08	12.74	16.94

Month	HCWID #6		CCWCID #3 (Avg. of 6 gages)		La Feria Pumping Plant		CCWCID #19		San Benito Pump	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	1.36	1.08	2.32	1.08	1.60	.90	1.33	.85	2.02	1.28
Feb.	2.59	1.34	3.95	1.73	3.45	1.61	3.17	1.42	2.26	.97
Mar.	.17	.61	.35	.77	.61	.74	.18	.55	.26	.99
Apr.	2.60	2.01	2.06	2.14	1.35	1.64	1.52	1.50	.34	1.16
May	.10	1.22	2.78	1.82	2.05	1.94	3.42	1.76	1.62	2.33
June	1.03	1.95	4.86	3.14	6.20	2.84	2.65	2.57	1.06	2.27
July	1.10	1.28	1.80	1.18	2.55	1.68	1.03	.81	.87	1.53
Aug.	.47	1.12	1.38	2.54	5.20	2.26	0	1.81	.46	1.96
Sept.	.10	2.86	.96	5.07	1.86	5.43	.64	3.38	.42	3.65
Oct.	2.90	3.02	4.64	3.85	4.50	4.50	3.40	2.83	2.68	2.36
Nov.	2.34	1.36	2.91	1.82	3.55	1.88	.98	1.33	1.90	.96
Dec.	.21	.62	.32	.82	.70	.89	.20	.81	.31	1.27
Yearly	14.97	18.47	28.33	25.96	33.62	26.31	18.52	19.62	14.20	20.73

Month	Whipple Farm		CCWID #11 (Avg. of 18 gages)		Los Fresnos Pump					
	1959	Average	1959	Average	1959	Average				
Jan.	3.37	1.38	3.00	1.35	2.75	1.41				
Feb.	2.85	2.17	2.99	2.06	3.00	2.30				
Mar.	.50	.79	.53	1.00	.60	.55				
Apr.	1.30	1.66	1.65	1.48	3.35	1.84				
May	.20	2.18	0	1.16	T	1.29				
June	8.40	3.06	3.32	1.73	5.20	4.11				
July	.98	2.16	.37	1.31	1.85	2.00				
Aug.	1.26	1.59	1.64	2.32	1.00	1.71				
Sept.	.51	4.25	0	3.68	.40	4.66				
Oct.	2.95	3.70	3.17	2.21	3.50	5.31				
Nov.	1.47	2.08	.50	1.68	2.60	2.09				
Dec.	.90	.79	.77	.84	.65	.70				
Yearly	24.69	25.81	17.94	20.82	24.90	27.97				

^u Estimated

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Tabulated below, in downstream order, are monthly records of Mexican rainfall stations with averages for their periods of record. For location, elevation, period of record, type of gage in use, watershed subdivision in which the station is located, and the observer, see alphabetical listing of these stations shown on pages 107 through 109 of this bulletin. These rainfall records have not been published elsewhere. Records of daily rainfall amounts, where available, are on file in the office of the Mexican Section.

Detailed listings of the months and years for which records are available through 1956 may be found under "Index to Precipitation Records" in Water Bulletins 10, 14, 22 and 26.

Month	Juárez, Chihuahua		"Garita" Km. 28 Chihuahua		Zaragoza, Chihuahua		San Agustín, Chihuahua		Guadalupe, Chihuahua	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.28	.38	.07		.07		.07	.56	.12	.44
Feb.	T	.43	T		0	.64	T	.55	0	.50
Mar.	.05	.42	0		.06	1.60	0	.94	T	1.31
Apr.	.12	.37	.05		.03	.10	.09	.26	T	.18
May	0	.43	.39		.46	.17	.56	.92	.77	.34
June	.35	.64	.15		.38	.48	.44	.33	1.06	.18
July	.77	1.26	.17		.12	.68	.80	.37	.52	.50
Aug.	1.44	1.60	1.92	1.94	1.36	.78	1.04	1.00	1.05	1.38
Sept.	.02	1.33	0		2.68	.04	3.81	.12	1.56	.17
Oct.	.94	1.11	.81		1.97	.57	.54	.87	1.65	.99
Nov.	.14	.53	.26		.22	.21	.20	.22	.14	.31
Dec.	.22	.51	.23		.12	.24	.12	.29	.14	.15
Yearly	4.33	9.01	4.05		3.91		4.32	9.15	3.68	8.32

Month	Samalayuca, Chihuahua		Tinajas, Chihuahua		San Antonio, Chihuahua		Los Barriles, Chihuahua		Praxedis G. Guerrero Chihuahua	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.26	.50	.14	.17	.16		.24		.16	.44
Feb.	0	.67	0	.53	0		T		0	.40
Mar.	0	.90	0	.64	0		0		0	.76
Apr.	.04	.26	0	.10	.04		.21		.02	.14
May	.10	.56	.24	.65	.34		T		.02	.25
June	1.16	1.42	.17	.36	1.73		.69		.82	.84
July	.91	1.00	1.69	1.00	2.03	2.06	.54	1.00	.50	.60
Aug.	1.83	1.72	1.46	1.78	2.37	2.18	2.46	2.26	1.26	1.09
Sept.	0	2.70	0	.77	.09	1.52	T	2.16	.09	1.52
Oct.	.53	1.36	1.05	1.08	1.07	1.68	1.19	2.23	1.09	2.09
Nov.	.47	.41	.48	.36	1.14	.89	1.90	1.17	.39	.37
Dec.	.33	.16	.09	.04	.09	.04	.19	.10	.09	.04
Yearly	5.63	11.66	5.32	7.48	9.06		7.42		4.44	8.54

Month	Porvenir, Chihuahua		Vado de Cedillos, Chihuahua		Luis L. León, Chihuahua		Félix U. Gómez (Los Lamentos), Chihuahua		Bachiniva, Chihuahua	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.15	.40	.11		.28		.24	.34	0	.46
Feb.	T	.32	T		T		0	.34	.35	.11
Mar.	T	.68	T		0		0	.34	0	.38
Apr.	T	.06	.22	.28	.33	.42	.65	.29	.20	.17
May	.74	.80	.58	.67	1.09	.70	.20	.08	.30	.14
June	.17	.24	.43	.40	.56	.72	1.42	.63	.89	1.19
July	.35	.94	.64	.95	.82	.75	1.54	.27	2.72	.56
Aug.	2.37	1.56	2.43	1.44	1.57	1.07	2.40	2.61	11.04	5.20
Sept.	0	.70	T	1.20	T	1.42	.24	1.15	.41	1.42
Oct.	.78	1.34	1.00	1.44	.89	1.90	1.97	1.64	1.93	1.41
Nov.	.56	.50	.39	.24	1.27	1.02	.18	.27	.79	.32
Dec.	.05	.05	T		T	.10	.05	.04	1.24	.26
Yearly	5.17	7.59	5.80		6.91		8.88	10.10		16.70

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Month	Cd. Guerrero, Chihuahua		La Junta, Chihuahua		Siquirichic, Chihuahua		Cuahtémoc, Chihuahua		El Vergel, Chihuahua	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.06	.59	.01	1.11	.08	.03	0	.26	.37	1.36
Feb.	.39	.40	.43	.54	.52	.59	.16	.12	1.79	.90
Mar.	T	.21	0	.35	T	.03	0	1.06	T	1.18
Apr.	1.67	.20	1.72	.26	.75	.25	.75	.22	.85	.50
May	.33	.25	.05	.24	T	T	.28	.21	.63	.91
June	1.08	1.60	1.01	1.64	.96	1.43	2.26	1.49	1.99	2.36
July	3.29	4.41	4.05	5.37	4.26	2.92	.98	4.67	4.29	5.16
Aug.	14.59	5.25	6.91	5.18	6.32	5.94	7.68	4.10	8.37	7.44
Sept.	.37	3.09	.88	2.30	.57	3.26	1.79	2.54	2.38	5.31
Oct.	1.89	1.27	2.59	1.38	1.06	1.50	1.22	1.19	1.06	1.96
Nov.	.41	.50	.64	.38	.45	.43	.37	.20	.55	.45
Dec.	2.46	.71	2.07	.86	2.48	.92	1.54	.44	1.56	1.58
Yearly	26.54	18.48	20.36	19.61	17.45	17.27	17.03	16.50	23.84	29.11

Month	Balleza, Chihuahua		San Juanito, Chihuahua		San Isidro, Chihuahua		El Sitio, Chihuahua		El Maguey, Chihuahua	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.40	.30	.39		0	.40	0	.38	.04	.21
Feb.	.06	.33	.39		.20	.22	0	.12	0	.08
Mar.	T	.09	T		T	.06	0	.07	0	.13
Apr.	.61	.19	8.07		2.20	1.10	1.10	.30	.94	.26
May	.17	.15	.26		.55	.42	0	.59	0	.32
June	2.49	1.28	0		1.85	2.34	1.10	1.22	1.04	1.26
July	1.84	4.37	39.49		3.62	4.56	2.13	2.99	1.20	3.87
Aug.	5.48	4.54	13.81		11.69	7.46	9.72	5.68	6.54	4.40
Sept.	T	3.45	5.35		.85	5.31	1.75	3.80	1.73	3.90
Oct.	0	.81	1.28		.28	1.35	.35	.93	.37	1.23
Nov.	.51	1.24			.67	.35	.35	.13	.39	.20
Dec.	1.44	.48	4.92		2.09	.87	1.18	.42	1.28	.30
Yearly		16.50	75.20		24.00	24.44	17.68	16.63	13.53	16.16

Month	Santa Rita, Chihuahua		La Boquilla, Chihuahua		Ojo Caliente, Chihuahua		San Antonio, Durango		Jiménez, Chihuahua	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	0	.49	.50	.31	.45	.17	.10	.37	.35	.24
Feb.	.04	.37	.03	.14	.04	.11	.04	.08	.04	.03
Mar.	T	.05	T	.16	T	.17	T	.05	.12	.10
Apr.	1.26	.42	.80	.18	.59	.15	.45	.23	.16	.12
May	.87	.38	.75	.58	1.52	.52	T	.47	1.26	.66
June	3.50	1.31	.88	1.41	2.13	1.58	2.64	1.86	1.04	.44
July	1.83	1.70	.38	2.88	.91	3.14	1.48	3.76	.65	2.37
Aug.	8.54	2.95	5.70	2.94	6.98	2.39	7.24	3.63	2.30	1.71
Sept.	.20	1.86	.48	2.93	.43	2.51	1.52	4.00	.65	2.17
Oct.	.79	1.69	.10	.93	.14	1.15	.49	1.16	.61	1.20
Nov.	.12	.16	T	.36	.10	.11	.04	.21	.04	.13
Dec.	.45	.68	.64	.39	.66	.24	.30	.29	.14	.22
Yearly	17.60	12.06	10.26	13.21	13.95	12.24	14.30	16.08	7.36	9.39

Month	Escalón, Chihuahua		Parral, Chihuahua		Camargo, Chihuahua		Rosetilla, Chihuahua		Villalba, Chihuahua	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.		.60	.57	.17	1.77	.90	0	.50	0	.40
Feb.		.38	.16	.18	.39	.24	.11	.07	.24	.17
Mar.	0	T	.12	0	.01	0	.14	0	.03	
Apr.		T	.28	.20	.63	.21	1.50	.23	1.34	.17
May		.88	.10	.36	1.50	1.35	0	.26	.02	.25
June		.07	3.36	1.54	.75	.58	1.15	1.08	1.14	.80
July	3.68	1.28	1.99	4.04	1.85	1.99	1.62	2.38	1.33	3.47
Aug.	2.62	4.41	3.95	4.57	2.40	3.17	2.42	3.55	2.72	
Sept.	.98	2.12	1.04	4.18	.43	2.50	.20	2.10	.39	2.74
Oct.	.31	1.75	.28	1.21	.16	1.80	.05	.82	.16	1.12
Nov.	T	.10	.16	.54	.08	.72	0	.20	.31	.24
Dec.	.16	.21	.39	.44	.57	.61	.87	.31	.92	.37
Yearly		10.01	12.74	16.93	12.70	13.31	8.67	10.51	9.40	12.48

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Month	Las Virgenes, Chihuahua		La Soledad, Chihuahua		Delicias, Chihuahua		Las Burras, Chihuahua		Planta Zootécnica, Chihuahua	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	T	.32	0	.40	T	.36	.02	.29	0	.61
Feb.	.02	.06	.24	.10	.18	.10	.24	.14	.08	.32
Mar.	0	.04	0	.08	0	.11	0	.12	0	.05
Apr.	1.29	.17	.94	.35	1.24	.24	1.73	.25	.59	.30
May	.30	.26	0	.24	.12	.24	.05	.37	.04	.76
June	.85	.96	.63	.93	1.16	1.15	.66	.87	.35	.70
July	1.57	2.20	.79	1.36	.73	2.38	1.43	2.41	1.34	2.08
Aug.	2.87	2.07	4.25	2.68	3.60	2.65	3.41	2.31	4.06	3.63
Sept.	.71	1.78	.75	4.21	.61	1.90	.40	2.12	.79	2.88
Oct.	.20	.73	.59	1.46	.16	.80	.44	.59	.81	1.56
Nov.	.96	.18	T	.73	.27	.35	.13	.37	.29	.24
Dec.	.83	.35		.20	.81	.37	.78	.25	.73	.24
Yearly	9.60	9.12		12.01	9.34	10.57	9.51	9.85	9.16	13.42

Month	Chihuahua, Chihuahua		Los Ojos, Chihuahua		Las Choyas, Chihuahua		Los Pozos, Chihuahua		Maclovio Herrera, Chihuahua	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	T	.30	0	.80	0	.53	0	.65	0	.39
Feb.	.04	.20	.20	.37	.28	.54	.20	.39	.37	.17
Mar.	0	.21	0	.20	0	.05	T	.10	0	.20
Apr.	.45	.17	1.14	.59	1.85	.48	.37	.10	.69	.24
May	.28	.38	.59	1.33	0	.26	.39	.84	.04	.56
June	.78	1.38	.28	.16	2.42	.92	.55	.95	.33	1.24
July	1.27	3.34	2.68	4.07	.35	1.53	1.54	1.87	.35	2.57
Aug.	3.25	3.32	4.67	2.93	5.01	3.27	3.74	3.06	4.92	2.75
Sept.	.93	2.94	.71	4.34	1.06	1.97	.20	2.11	.08	3.17
Oct.	.47	.86	.73	1.44	.71	1.58	.67	1.02	.47	2.37
Nov.	.39	.45	.08	.12	.24	.32	1.30	.84	.51	3.03
Dec.	.73	.38	.47	.22	.39	.18	.24	.07	.18	.78
Yearly	8.59	13.93	11.55	16.57	12.31	11.63	9.20	12.00	7.94	17.47

Month	Majorna, Chihuahua		Chilicote, Chihuahua		Ojinaga (IB&WC), Chihuahua		Ojinaga (M. S. of Mexico), Chihuahua		Las Norias, Coahuila	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	0	.69	0	.82	0	.54	0	.30		
Feb.	.20	.55	.43	.54	.41	.46	.40	.20		
Mar.	0	.03		.02	0	.04	0	.18		
Apr.	.37	.13	0	.57	.35	.57	.26			
May	.91	.74		.14	1.57	.52	1.57	.56	.39	
June	2.76	1.10	.59	.26	1.39	.59	1.39	.78	1.50	
July	2.66	2.81	.98	1.02	1.42	.65	1.42	1.09	1.97	
Aug.	5.10	2.98	3.33	2.15	1.00	1.27	.98	1.23	.43	
Sept.	.85	3.56	.31	2.36	.64	.43	.64	1.24	.98	
Oct.	.79	1.31	.67	1.18	.46	.92	.46	.95	0	
Nov.	.49	.33	.28	.34	.41	.22	.41	.35	0	
Dec.	.45	.26	.08	.04	.38	.15	.38	.38	0	
Yearly	14.58	14.49		8.87	8.25	6.14	8.22	7.52		

Month	Santo Domingo, Coahuila		Los Angeles, Coahuila		Santa Rosa, Coahuila		Cd. Acuña, Coahuila		Palestina, Coahuila	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.					.30	.40	.63	.62	T	.08
Feb.					.80		.50	.39		.96
Mar.							0	.50		.70
Apr.					2.60	1.80	2.24	1.55	1.36	1.56
May	2.50				2.80	2.20	5.55	3.09	2.97	2.88
June					1.50	3.00	9.37	2.62	4.57	2.12
July					.60		3.46	.57	1.48	1.80
Aug.					2.00	2.75	.59	1.09	1.61	2.09
Sept.					3.60	3.30	.77	2.80	2.76	2.99
Oct.							5.18	2.06	3.13	1.45
Nov.					.60		.57	.51	1.10	.73
Dec.					.50		.40	.41	.47	.91
Yearly							29.21	16.88	19.84	19.27

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Month	Jiménez, Coahuila		El Remolino, Coahuila		Piedras Negras, Coahuila		Aliende, Coahuila		Villa Guerrero, Coahuila	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.31	.78	0		.46	.77	.08	.63	0	
Feb.	.43	.81	.55		.56	.73	.69	1.27	.55	
Mar.	T	.83	0		T	.76	0	.38	0	
Apr.	2.67	1.69	1.02		2.16	2.21	1.10	1.22	1.24	
May	2.57	3.47	4.29		4.95	3.34	3.03	2.48	1.81	
June	14.13	3.71	3.41	3.84	2.76	1.90	2.76	2.00	2.77	4.00
July	2.83	.94	2.00	1.00	7.07	2.13	4.17	1.46	3.96	2.42
Aug.	.20	1.76	.87	.58	1.28	2.22	3.25	2.13	1.30	1.47
Sept.	.83	2.09	.49	5.78	.69	2.89	1.73	2.71	2.28	6.42
Oct.	3.64	2.16	2.19	3.86	4.80	2.81	1.20	1.70	2.32	3.70
Nov.	.76	.78	.16	.28	.70	.71	.71	.46	.63	.32
Dec.	.57	.49	.45	.52	.20	.55	.39	.52	.37	.70
Yearly	28.94	19.51	15.43		25.63	21.02	19.11	16.96	17.23	

Month	Rancho San Diego, Coahuila		Rancho San Jesus, Coahuila		Villa Hidalgo, Coahuila		Rancho los Vidrios, Tamaulipas		Nuevo Laredo (M. S. of Mexico), Tamps.	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.					1.14	.90	.37	1.55	.67	.81
Feb.					1.73	.92	1.26	1.97	2.62	.87
Mar.					.16	.53	0	.09	0	.69
Apr.					.41	1.36	.22	.64	1.06	1.12
May	2.42	3.24	2.68		1.50	3.06	1.21	4.07	.67	2.39
June	0	0	2.81	3.02	4.48	1.20	3.14	1.61	2.95	1.86
July	1.61	2.20	.24	3.76	2.91	.91	4.61	2.54	1.75	1.40
Aug.	1.14	3.14	0		.93	1.43	.31	.43	2.76	1.30
Sept.	2.05	4.05	1.39		.12	2.61	0	2.35	.31	2.54
Oct.	.43		2.52		1.77	2.43	.08	3.30	.53	1.42
Nov.	.39		.57		1.42	.80	.20	.95	.12	.88
Dec.	0		.78		.39	.57	.38	.47		.92
Yearly					16.96	16.72	11.78	19.97		16.20

Month	Nuevo Laredo (IB&WC), Tamps.		Rancho San Juan de la Palma, Tamps.		Conchos, Coahuila		Muzquiz, Coahuila		Nueva Rosita, Coahuila	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.67	.58	.89	1.09	T	.27	T	.84	.10	.70
Feb.	2.18	.88	2.19	1.37	.49	.50	.47	.58	.70	.53
Mar.	0	.32	.01	.76	0	.29	0	.93	T	.33
Apr.	.75	.62	.41	.67	1.42	1.12	1.61	1.15	.96	1.17
May	.56	2.42	.09	1.43	3.34	2.82	7.89	3.83	1.27	2.84
June	2.84	1.59	2.70	1.49	1.49	1.05	5.59	2.99	1.13	1.79
July	1.63	1.07	2.07	.91	2.32	1.88	10.17	2.18	2.58	1.41
Aug.	2.35	1.44	.29	1.24	6.57	2.12	2.62	1.40	1.83	
Sept.	.37	1.78	.18	2.54	1.44	2.72	1.73	5.10	3.33	2.57
Oct.	.51	1.35	2.30	2.24	1.24	1.84	1.43	2.32	1.27	1.63
Nov.	.87	.79	.71	1.32	.37	.65	.14	1.16	1.09	.50
Dec.	.08	.28	.24	.41	.45	.35		1.04	.29	.66
Yearly	12.81	13.12	12.08	15.47	19.13	15.61		24.74	14.12	15.96

Month	Sabinas, Coahuila		Villa Juárez, Coahuila		Cuatro Ciénegas, Coahuila		San Buenaventura, Coahuila		Castanos, Coahuila	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.01	.68	.11	.62	0	.34	.02	.63	.47	.55
Feb.	.78	.88	.51	.45	.31	.36	.76	.48	1.71	.52
Mar.	0	.47	0	.24	.12	.07	T	.21	.12	.28
Apr.	1.06	1.22	.44	.97	.26	.27	.64	.53	.51	.61
May	1.67	2.86	1.32	2.10	.22	.88	2.12	1.40	3.19	1.77
June	1.68	2.00	.96	1.02	.35	.62	1.75	1.53	2.00	1.96
July	3.39	1.23	3.50	.96	.30	.68	3.91	1.54	2.44	1.41
Aug.	.53	2.26	1.14	1.87	1.10	.92	T	1.85	1.71	2.21
Sept.	2.56	3.54	1.28	3.16	.31	1.39	1.63	2.18	1.50	2.90
Oct.	.13	1.76	2.87	2.12	.57	.83	1.70	1.36	1.16	1.66
Nov.	.43	.47	.51	.51	.18	.30	.19	.50	.31	.31
Dec.	.16	.56	.23	.35	.23	.43	.12	.62	.14	.30
Yearly	12.40	17.93	12.87	14.37	3.95	7.09	12.84	12.83	15.26	14.48

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Month	Monclova, Coahuila		Progreso, Coahuila		Don Martin, Coahuila		Laguna de Salinillas, Nuevo León		Lampazos, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.06	.47	0	.53	.10	.80	.31	.72	.30	1.12
Feb.	.59	.48	1.03	.45	1.24	.68	.63	.70	1.50	1.29
Mar.	0	.28	T	.21	0	.52	T	.53	T	.16
Apr.	.61	.54	0	1.21	.89	1.18	.71	.97	.83	.48
May	2.95	1.52	.47	2.40	1.14	2.32	1.10	2.39	1.36	2.08
June	.39	1.12	.72	1.38	.27	1.60	.79	1.27	1.38	2.63
July	1.86	1.50	5.48	.88	2.06	1.05	4.39	.71	3.23	2.00
Aug.	.77	1.58	3.55	2.22	5.79	2.06	2.07	2.92	2.22	1.94
Sept.	1.51	2.94	.50	2.88	.06	2.99	.04	2.93	.22	6.52
Oct.	1.00	1.23	1.72	2.06	3.56	1.82	1.46	1.91	2.07	
Nov.	.26	.57	.32	.45	.69	.58	.54	.49	.30	
Dec.	.05	.54	T	.51	.22	.70	.22	.54	.10	
Yearly	10.05	12.77	13.79	15.18	16.02	16.30	12.26	16.08	13.51	

Month	Añhuac, Nuevo León		La Gloria, Nuevo León		Vallecillo, Nuevo León		Bustamante, Nuevo León		Sabinas Hidalgo, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.24	.77	.23		.40		0	.10	.51	
Feb.	1.63	.62	1.60		1.54		0	0	3.37	
Mar.	T	.58	0		.10		0	.02	.12	
Apr.		.99	.54		.59		.77	.38	.40	
May		2.63	1.16		2.33		.24	.80	.14	.97
June	.76	1.38	.93		1.86		3.36		2.02	4.80
July	3.38	1.35	4.99		4.39		1.61		2.72	4.28
Aug.	5.87	2.05	4.27		2.44		1.16	.58	3.38	1.62
Sept.	.10	2.78	.22		5.40		0	8.87	2.05	6.28
Oct.	.24	.36	.43				1.16	5.46	1.24	5.79
Nov.	.30	.02	.47		.24		.88	.53	.78	1.79
Dec.	.08	.01	.17		.08		.26	.27	.12	.83
Yearly		13.54	15.01				10.12			.26
									19.50	

Month	Parás, Nuevo León		Nueva Cd. Guerrero, Tamaulipas		Cerralvo, Nuevo León		Cd. Mier, Tamaulipas		Laguna de Sánchez, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.04	.10	1.56	1.66	.01	.71	1.42	1.64	.49	.43
Feb.	.08	.08	2.32	1.10	1.38	.65	2.09	1.75	1.99	.56
Mar.	0	.05	.24	.48	T	.63	.20	1.36	.16	.50
Apr.	T	.67	1.48		.51	1.94	1.38	2.16	1.25	1.16
May	0	.20	.14	1.38	1.18	2.93	T	3.81	1.77	2.13
June	.78	1.62	3.78	2.25	.25	2.26	1.48	1.87	3.26	3.38
July	1.57	.78	2.19	1.06	.85	1.42	.18	.52	3.54	2.73
Aug.	5.12	2.64	1.28	.93	2.36	3.27	.98	1.94	2.58	4.51
Sept.	.78	3.40	2.38	2.37	2.00	4.80	1.00	2.51	3.17	4.97
Oct.	.43	9.27	.93	2.19	3.42	2.86	2.56	2.85	2.81	3.54
Nov.	0	2.22	2.78	.78	.46	.67	.98	1.15	T	.46
Dec.	0	0	.18	.12	.06	.39	.16	.21	.49	.52
Yearly	8.80	20.36	18.45	15.80	12.48	22.53	12.43	21.77	21.51	24.89

Month	Villa Allende, Nuevo León		Rinconada, Nuevo León		Santa Catarina, Nuevo León		La Peña de San Cristobal, Nuevo León		A. Blanca Canoas, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.65	.85	.51	.20	.05	.80	0	.24	.69	.63
Feb.	2.09	1.09	1.30	.44	2.28	.49	1.97	1.50	2.27	1.44
Mar.	.17	1.10	.47	.22	.16	.29	0	.20	.17	.37
Apr.	2.68	2.39	1.30	.65	.99	.66	.79	.40	1.77	1.21
May	3.11	3.36	.02	.40	.71	.67	T	.75	1.89	1.74
June	4.35	4.44	1.65	1.08	2.28	1.91	5.12	7.98	3.98	4.28
July	.55	2.98	.08	.35	2.57	1.32	4.33	3.74	2.95	2.46
Aug.	3.50	4.83	.47	1.30	2.45	2.92	1.30	2.52	4.04	3.82
Sept.	2.32	6.90	.87	1.60	3.66	3.33	1.57	3.44	4.07	5.40
Oct.	4.76	6.31	.90	.96	1.64	1.98	1.46	7.90	3.27	5.00
Nov.	.45	1.28	.63	.25	.51	.47	3.27	2.32	1.00	1.23
Dec.	.02	1.03	T	.30	T	.60	.75	.96	.47	.78
Yearly	24.65	36.56	8.20	7.75	17.30	15.44	20.56	31.95	26.57	28.36

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Month	Pajonál, Nuevo León		La Cruz, Nuevo León		Rodeo, Nuevo León		Morteros, Nuevo León		Huasteca, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	T	.26	1.30	.98	.20	.42	.16	.26	.28	.34
Feb.	2.36	1.30	2.62	1.48	1.85	1.06	1.87	1.04	1.97	1.15
Mar.	0	T	.16	.24	.04	.08	0	.03	.08	.12
Apr.	1.37	.80	.89	.66	.83	.58	.67	.58	.75	.65
May	1.02	1.42	1.63	2.10	.16	.55	3.25	1.90	.39	.40
June	2.93	3.70	2.95	4.00	2.80	3.72	3.09	2.84	2.12	1.63
July	7.42	4.68	5.63	3.86	3.74	2.90	0	1.54	2.44	3.26
Aug.	4.45	4.41	2.56	5.16	2.09	2.28	1.14	1.71	1.14	2.10
Sept.	3.46	5.05	2.70	4.50	5.00	4.54	4.53	4.90	4.02	5.38
Oct.	1.85	4.70	3.80	5.75	2.44	4.07	1.73	4.14	1.74	5.18
Nov.	0	.67	.57	1.15	0	.46	0	.44	.63	.77
Dec.	T	.27	0	0	0	.04	0	.24	.08	.26
Yearly	24.86	27.26	24.81	29.88	19.15	20.70	16.44	19.62	15.64	21.24

Month	Jaguey, Nuevo León		Monterrey, Nuevo León		Canadá, Nuevo León		San Nicolás, Nuevo León		Mirador, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.51	.71	.64	.65	0	.28	.61	.64	1.50	.75
Feb.	2.56	1.54	2.00	.65	0	.44	2.46	1.62	5.75	2.88
Mar.	.04	.09	.04	.73	0	0	.06	.09	.15	.35
Apr.	1.40	.94	1.09	1.15	0	0	.85	.94	5.35	3.38
May	.55	.61	.57	1.52	.71	5.18	.34	.70	1.93	2.14
June	2.30	3.34	1.84	2.76	4.13	6.61	2.84	3.90	3.86	6.74
July	1.42	2.16	1.65	2.45	1.34	1.50	1.56	1.56	3.35	5.32
Aug.	1.04	1.42	.60	3.06	.59	.49	.88	.88	1.54	3.90
Sept.	3.60	6.56	3.87	5.65	1.93	6.55	3.10	7.56	5.24	11.38
Oct.	2.72	8.44	2.16	3.36	.98	9.96	2.76	6.65	4.84	16.04
Nov.	.51	.76	.39	1.26	0	.57	.67	.70	1.18	1.60
Dec.	.02	.20	.05	.77	0	0	.08	.11	.71	1.22
Yearly	16.67	26.77	14.90	24.01	9.68	31.58	16.21	25.35	35.40	55.70

Month	Presa Estanzuela, Nuevo León		San Pablo, Nuevo León		Mederos, Nuevo León		Noria, Nuevo León		Puerto Gringo, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.94	.47	2.40	2.02	.51	.47	.85	.72	0	0
Feb.	2.24	1.34	5.59	3.62	2.14	1.50	2.95	1.90	0	0
Mar.	0	.49	.39	.41	0	.12	0	.24	.08	.04
Apr.	0	1.04	2.76	1.91	1.50	.90	.61	.46	2.24	1.12
May	0	4.82	.87	1.72	1.40	2.10	1.38	3.21	1.02	.51
June	3.82	6.46	3.86	4.16	6.24	6.64	2.07	3.64	6.77	10.76
July	5.20	6.54	2.99	5.63	3.42	2.22	1.42	2.36	7.48	7.52
Aug.	4.13	5.22	6.54	5.85	1.44	3.28	1.48	2.65	4.37	5.57
Sept.	5.71	13.31	4.02	12.80	4.09	11.03	3.86	12.30	4.09	11.32
Oct.	0	7.12	3.46	13.30	0	9.31	11.79	13.72	6.81	15.61
Nov.	0	1.16	.71	.61	0	.69	.71	1.29	.15	1.14
Dec.	0	0	.39	1.00	0	.30	.30	.42	T	T
Yearly	22.04	47.97	33.98	53.03	20.74	38.56	27.42	42.91	33.01	53.59

Month	Tunel San Francisco, Nuevo León		Las Comitas, Nuevo León		Villa de Santiago, Nuevo León		Sabinal, Nuevo León		Cerro Prieto, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.61	.54	.41	.29	.49	.82	1.06		0	0
Feb.	2.91	1.92	1.93	.39	2.09	1.05	3.78		2.09	2.09
Mar.	.49	.50	.12	.31	.18	.99	.24		.43	.43
Apr.	2.78	1.69	1.21	.90	1.18	1.65	2.28		.87	.87
May	1.76	2.49	.65	1.05	2.20	2.72	3.23		2.01	3.22
June	5.25	6.86	3.22	2.63	5.35	4.99	6.14		5.75	3.58
July	3.70	3.96	3.92	1.72	4.35	3.21	4.29		.59	.38
Aug.	4.68	5.76	2.47	3.52	4.92	5.33	2.28		2.64	1.91
Sept.	7.78	11.46	3.94	4.34	9.67	8.60	7.76		3.27	4.18
Oct.	6.12	13.73	2.22	2.25	4.83	5.67	4.88		1.93	4.80
Nov.	.62	2.20	.18	.44	.12	1.33	.51		.20	.34
Dec.	.09	.90	.08	.42	.02	.96	.51		0	.16
Yearly	36.79	52.01	20.35	18.26	35.40	37.32	36.96		19.78	21.96

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Month	Cadereyta, Nuevo León		Ciénega, Nuevo León		Manzano, Nuevo León		Puerto Mauricio Arriba, Nuevo León		Adjuntas, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.53	.77	.31	.45	.51	.90	.45	.31	.45	.45
Feb.	2.07	.98	1.65	1.12	1.85	1.35	3.46	2.36	1.85	1.24
Mar.	.10	1.19	.08	.16	.31	.37	.16	.38	.39	.28
Apr.	.81	2.13	1.69	1.00	2.76	1.58	2.85	1.42	2.24	1.36
May	1.33	2.16	.94	2.78	2.40	2.90	2.99	3.46	1.10	2.84
June	3.16	3.31	2.76	7.15	5.31	9.09	4.99	4.34	6.30	8.44
July	4.39	2.39	2.44	3.19	6.61	5.80	7.76	6.60	3.86	3.92
Aug.	1.84	3.54	3.31	3.06	4.59	5.09	3.11	4.27	4.09	4.62
Sept.	4.85	4.64	2.60	6.68	6.06	9.60	4.33	11.26	2.28	8.38
Oct.	4.80	3.38	5.47	10.51	5.31	13.07	7.56	15.26	5.63	8.38
Nov.	.06	1.13	0	1.02	.15	1.00	.20	1.34	.16	.90
Dec.	.10	.71	.12	1.64	.16	.88	.08	.38	.12	.88
Yearly	24.04	26.33	21.37	38.76	36.02	51.24	38.39	51.52	28.33	41.69

Month	Potrero Redondo, Nuevo León		Paraíso, Nuevo León		Las Peñas, Nuevo León		Rafces, Nuevo León		Cerritos, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.87	.87	.83	.83	.98	1.18	.83	.90	.37	.45
Feb.	3.52	2.34	3.54	3.20	3.66	3.84	3.15	2.66	1.50	1.12
Mar.	1.08	.54	.24	.58	.51	.86	0	.59	.08	.16
Apr.	3.37	2.09	3.11	1.75	3.78	2.24	2.16	1.57	.98	.66
May	5.24	4.24	2.52	5.04	4.53	6.20	2.56	4.24	1.34	2.94
June	6.12	7.99	6.14	6.62	6.34	5.56	5.51	6.81	4.21	6.15
July	7.30	6.58	5.00	6.32	4.37	6.34	2.24	5.74	3.70	4.74
Aug.	4.66	4.74	1.97	2.42	3.98	4.84	3.94	4.33	4.13	6.18
Sept.	2.54	4.04	2.99	11.40	4.33	13.74	4.53	13.11	3.80	17.44
Oct.	8.72	13.54	8.15	18.34	6.89	18.80	6.10	14.04	2.97	9.89
Nov.	.39	.39	1.61	2.68	1.50	2.82	1.61	3.16	.12	.92
Dec.	.35	.35	0	.59	0	.90	0	0	0	.40
Yearly	44.16	47.71	36.10	59.77	40.87	68.32	32.63	57.15	23.20	51.05

Month	San Juan, Nuevo León		Arteaga, Coahuila		Ciénega La Purísima, Coahuila		Potrero Abrego, Coahuila		Puerto de la Camotera, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.45	1.20	.59	.61	1.06	1.31	1.85	1.42	.71	.51
Feb.	2.27	1.05	2.48	1.54	4.46	3.08	2.76	1.68	.66	.61
Mar.	T	.98	0	.15	.67	.96	.31	.41	1.81	1.14
Apr.	.78	2.26	.71	.63	.79	.90	1.85	1.30	1.85	1.26
May	.74	1.60	2.05	1.28	1.65	1.61	3.66	3.16	.98	2.42
June	3.05	2.28	1.34	1.91	2.87	3.01	2.05	3.44	4.12	5.89
July	2.38	1.27			2.52	2.99	3.88	3.18	3.35	3.72
Aug.	3.61	3.97	2.28	2.00	6.14	4.16	1.12	1.66	5.98	5.64
Sept.	.77	4.47	3.07	5.20	1.81	8.54	3.72	4.54	3.15	3.85
Oct.	1.10	3.24	4.41	4.20	4.80	6.98	2.91	5.41	4.45	12.90
Nov.	T	.61	.51	.67	.71	1.54	.16	1.10	0	.92
Dec.	T	.52	.20	.30	.23	.72	.75	1.28	.08	.96
Yearly	15.15	23.45			27.71	35.80	25.02	28.58	27.14	39.82

Month	Casillas, Nuevo León		San Francisco Rayones, Nuevo León		Rayones, Nuevo León		Mimbres, Nuevo León		Ciénega del Toro, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.75	.67	.86	1.02	1.50	.40	.55	1.54	1.85	1.52
Feb.	2.18	1.48	.86	.82	.06	.34	3.70	2.73	2.28	1.85
Mar.	.53	.45	0	0	.47	.34	.79	.83	.51	.71
Apr.	1.71	1.09	2.05	1.02	3.56	1.07	3.15	1.81	2.64	1.80
May	4.37	3.00	3.90	2.40	1.31	1.47	3.15	3.40	5.20	3.46
June	3.89	4.41	2.55	3.62	2.68	2.12	2.36	2.10	2.36	2.34
July	1.99	1.50	2.28	2.02	1.42	1.00	3.86	2.40	3.94	2.24
Aug.	1.76	2.14	1.77	2.06	.59	3.00	5.28	7.18	4.72	4.68
Sept.	1.67	2.28	2.76	3.98	2.16	2.80	2.87	5.96	2.95	5.47
Oct.	3.62	6.43	2.91	5.92	1.78	1.84	1.06	4.13	4.17	6.24
Nov.	.24		0	1.16	0	.42	0	1.58	.31	1.56
Dec.			0	.67	0	.27	1.69	2.36	1.50	2.16
Yearly			19.94	24.69	15.53	15.09	28.46	36.02	32.43	34.03

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Month	Potosí, Nuevo León		Rusio, Nuevo León		San Rafael, Nuevo León		Galeana, Nuevo León		Montemorelos, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	1.46	1.47	1.42		1.46		.79	.50	.83	.80
Feb.	2.52	1.89	3.07		2.36		.90	.90	2.05	.98
Mar.	.39	.54	.04		.24		.51	.25	.08	1.04
Apr.	1.61	.98	1.95		1.10		1.81	1.42	1.93	2.27
May	.98	1.18	2.00		3.86		1.73	1.52	3.35	2.89
June	1.14	1.33	1.26		.79		2.00	1.62	7.28	3.50
July	1.69	.96	2.76		3.86		2.60	2.72	2.64	2.03
Aug.	.75	1.72	1.61		2.00		3.66	2.72	3.13	3.97
Sept.	1.45	1.46	1.93		3.78		2.44	2.50	3.92	5.30
Oct.	2.09	2.84	3.52		3.15		2.91		2.54	3.76
Nov.	.59	1.86	.08		.20		0		.88	1.57
Dec.	.55	2.00	.35		.08		.39		0	.92
Yearly	15.22	18.23	19.99		22.88		19.74		28.63	29.03

Month	El Cuchillo, Nuevo León		Los Ramones, Nuevo León		Los Herrera (La Tableta), Nuevo León		Las Enramadas, Nuevo León		Gral. Bravo, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.83	.75	.75	.63	.83	.62	1.52	.98	1.00	.78
Feb.	1.57	.62	3.15	.79	1.33	.73	3.90	.75	2.32	.45
Mar.	.08	.48	T	.64	.04	.68	T	.67	.28	.59
Apr.	.21	1.57	.31	1.74	.41	1.39	.65	1.67	.47	1.55
May	4.84	2.11	1.02	1.98	.75	2.71	2.54	2.70	2.30	2.57
June	3.18	2.50	3.46	3.04	2.09	2.68	2.00	3.46	1.69	2.52
July	.93	1.39	1.14	1.73	1.63	1.27	2.87	2.17	.35	2.24
Aug.	.58	3.04	2.36	3.30	1.02	2.53	3.29	3.22	2.89	2.56
Sept.	2.98	3.60	.83	4.27	1.08	4.03	2.52	5.07	2.42	3.70
Oct.	1.51	2.21	1.81	2.62	1.39	2.25	1.44	2.43	1.50	2.10
Nov.	.02	.44	.08	.49	.31	.52	.60	.64	.28	.87
Dec.	.13	.39	T	.27	.24	.37	T	.67	.28	.72
Yearly	16.86	19.10	14.91	21.50	11.12	19.78	21.33	24.43	15.78	20.65

Month	Icamole, Nuevo León		Topo Chico, Nuevo León		Parras, Coahuila		Gral. Cepeda, Coahuila		Reata, Coahuila	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	T		0	.46	.04	.23	0	.43	0	.26
Feb.			1.57	.73	.70	.56	3.54	.49	.94	.31
Mar.			0	.58	.18	.72	0	.24	.20	.20
Apr.			0	.94	.68	.44	0	.32	0	.37
May	.47	.36	.55	.96	1.23	1.02	2.87	.86	.51	.48
June	2.52	2.28	.85	1.89	1.42	2.78	.87	2.14	1.10	1.10
July	.67	1.00	0	1.27	4.20	4.12	4.85	3.50	0	.58
Aug.	1.16	1.68	.35	2.80	1.97	1.58	3.96	2.90	0	2.49
Sept.	.53	3.55	.06	4.08	3.94	3.57	2.16	2.78	0	1.09
Oct.	.28	2.28	.90	2.74	3.47	4.12	4.13	1.42	5.90	.89
Nov.	3.35	1.83	.43	.75	.32	.66	.39	.50	.39	.38
Dec.	.06		0	.52	.27	.40	.22	.52	0	.20
Yearly			4.71	17.72	18.42	20.20	22.99	16.10	9.04	8.35

Month	Granja Guadalupe, Coahuila		Hedionda Grande, Coahuila		San Antonio de las Alazanas, Coahuila		Saltillo, Coahuila		Ramos Arizpe, Coahuila	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	T	.30	.94	.96	2.05	2.62	.49	.56	.33	.44
Feb.	1.10	.62	2.58	1.62	4.29	2.90	2.61	.52	2.26	.38
Mar.	.08	.11	.27	.39	1.46	1.12	.16	.37	T	.30
Apr.	.45	.34	1.06	.70	1.26	.77	1.46	.73	1.10	.49
May	.31	.64	4.43	3.74	2.08	1.50	4.70	1.05	2.72	.81
June	.47	.64	.43	1.56	2.72	2.80	1.95	2.08	1.52	1.11
July	2.07	1.72	6.65	3.88	3.27	2.82	3.76	2.66	1.99	1.40
Aug.	1.48	1.25	2.14	3.53	5.43	4.23	4.49	2.36	2.97	1.40
Sept.	.30	1.20	3.31	4.96	3.82	4.72	2.28	2.50	1.36	1.78
Oct.	1.69	2.60	3.46	3.34	4.88	5.86	2.40	1.29	2.70	.78
Nov.	0	.34	0	1.58	.28	1.82	.57	.89	.64	.46
Dec.	.08	.13	.39	.82	.63	1.66	.02	.62	T	.52
Yearly	8.03	9.89	25.66	27.08	32.17	32.88	24.89	15.63	17.59	9.87

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Month	La Popa, Nuevo León		Mina, Nuevo León		Carbonera, Nuevo León		Ciénega de Flores, Nuevo León		Higueras, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	.24	.46	.20	.42	.47	.80	1.74	1.18	.64	.73
Feb.	1.14	.74	1.89	1.08	3.11	2.02	4.54	.86	2.44	.59
Mar.	0	.07	.08	.04	.28	.48	.09	.71	.01	.53
Apr.	.57	.42	.45	.28	.94	.47	1.59	1.24	.36	1.14
May	2.30	1.23	.96	.50	5.00	2.88	1.46	2.18	2.37	1.72
June	2.87	3.02	2.95	2.64	2.52	1.95	3.78	2.55	.87	2.42
July	1.65	.92	1.26	1.16	1.93	2.16	5.09	2.02	4.00	2.10
Aug.	4.33	2.61	T	1.04	5.51	3.60	3.59	4.09	.83	2.90
Sept.	4.17	7.26	1.35	6.01	3.46	5.86	3.54	4.95	3.98	4.46
Oct.	1.69	2.82	2.00	4.25	3.98	3.44	3.02	2.41	2.60	1.69
Nov.	.28	.46	2.56	1.46	0	1.52	.96	.77	.48	.76
Dec.	.12	.22	T	.15	.47	1.00	1.04	.76	.01	.64
Yearly	19.36	20.23	13.70	19.03	27.67	26.18	30.44	23.73	18.59	19.68

Month	Comales, Tamaulipas		Camargo, Tamaulipas		San Miguel de Camargo, Tamaulipas		K-140, Nuevo León		Reynosa, Tamaulipas	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	1.26	.82	1.04	.97	.22	.98	2.39		1.46	.99
Feb.	1.77	.70	1.73	.94	1.78	.42	0		2.68	.77
Mar.	.04	.66	.22	.62	.08	.42			.18	.70
Apr.	.51	1.57	.45	2.06	.70	2.13	.46		.79	1.14
May	.50	2.03	.22	1.61	.65	1.21	.65		1.00	2.21
June	2.31	1.91	1.75	1.93	1.15	1.00			1.69	1.82
July	.38	.94	.06	.64	.14	.58	.67		.83	1.21
Aug.	.16	2.41	.73	1.25	.22	1.33	0		.47	1.44
Sept.	1.56	3.11	.85	1.89	.73	.50	0		.23	2.34
Oct.	1.06	2.20	.74	2.20	1.95	3.57	.70		1.39	2.56
Nov.	.29	.51	.37	.95	.82	.68	0		1.75	.89
Dec.	.21	.60	.20	.28	.19	.17	.35		0	.62
Yearly	10.05	17.46	8.36	15.34		13.14			12.47	16.69

Month	Reynosa, Tamaulipas		Río Bravo, Tamaulipas		Retamal, Tamaulipas		Control (C1-K-9), Tamaulipas		Iturbide, Nuevo León	
	1959	Average	1959	Average	1959	Average	1959	Average	1959	Average
Jan.	1.34		2.09	.58	1.30	.77	1.19		1.17	.38
Feb.	2.52		2.44	1.43	2.32	1.10	1.06		1.72	.64
Mar.	.24		.39	.72	.22	.76	.75		.57	.48
Apr.	.88		.90	1.68	.67	1.50	1.26		1.65	1.14
May	.07		.16	1.32	.04	1.62	3.46	2.46	1.10	1.99
June	.76		2.60	2.48	2.28	2.38	3.17	2.56	5.33	3.12
July	.70		.94	1.51	.83	.92	3.76	1.34	3.61	2.56
Aug.	.61		1.65	2.08	1.22	2.04	1.65	2.61	1.91	4.03
Sept.	.07		.16	3.16	.59	2.80	.24	4.65	3.00	4.95
Oct.	1.87		4.76	2.55	4.84	2.68	4.13	2.30	4.43	2.98
Nov.	1.78		2.05	1.09	1.71	1.05	.98	1.24	.30	.48
Dec.	.19		.28	.50	.24	.48	.64	.52	.52	.38
Yearly	11.03		18.42	19.10	16.26	18.10		22.06	25.31	23.13

Month	Linares, Nuevo León		Valle Hermoso, Tamaulipas		Matamoros, Tamaulipas		Méndez, Tamaulipas			
	1959	Average	1959	Average	1959	Average	1959	Average		
Jan.	.87	.95		.68			3.81	1.64	.94	
Feb.	1.57	.92		1.68			9.11	3.61	.94	
Mar.	.41	1.12		.48			.30	.33	.99	
Apr.	1.54	2.42		1.27			0	3.92	1.70	
May	3.90	3.61	3.46	2.50	T		.39	1.24	2.67	
June	3.76	3.44	3.17	2.95	6.16		3.92	8.42	2.74	
July	1.18	2.73	3.76	1.63	2.50		2.35	.86	1.09	
Aug.	1.52	3.29	1.65	1.45	0		0	1.88	3.28	
Sept.	2.85	6.25	.24	4.48	.26		.26	1.54	3.86	
Oct.	2.25	3.36	4.13	3.24	4.25		5.64	4.38	2.28	
Nov.	.53	1.21	.98	1.28	1.18		1.18	1.17	.57	
Dec.	.05	.91		.47	.65		.65	0	.39	
Yearly	20.43	30.21		22.19			27.61	28.99	21.45	

INTERNATIONAL BOUNDARY & WATER COMMISSION
 UNITED STATES & MEXICO
RIO GRANDE DRAINAGE BASIN
EL PASO, TEXAS TO THE GULF OF MEXICO
ISOHYETAL MAP FOR YEAR 1959
 PRECIPITATION IN INCHES

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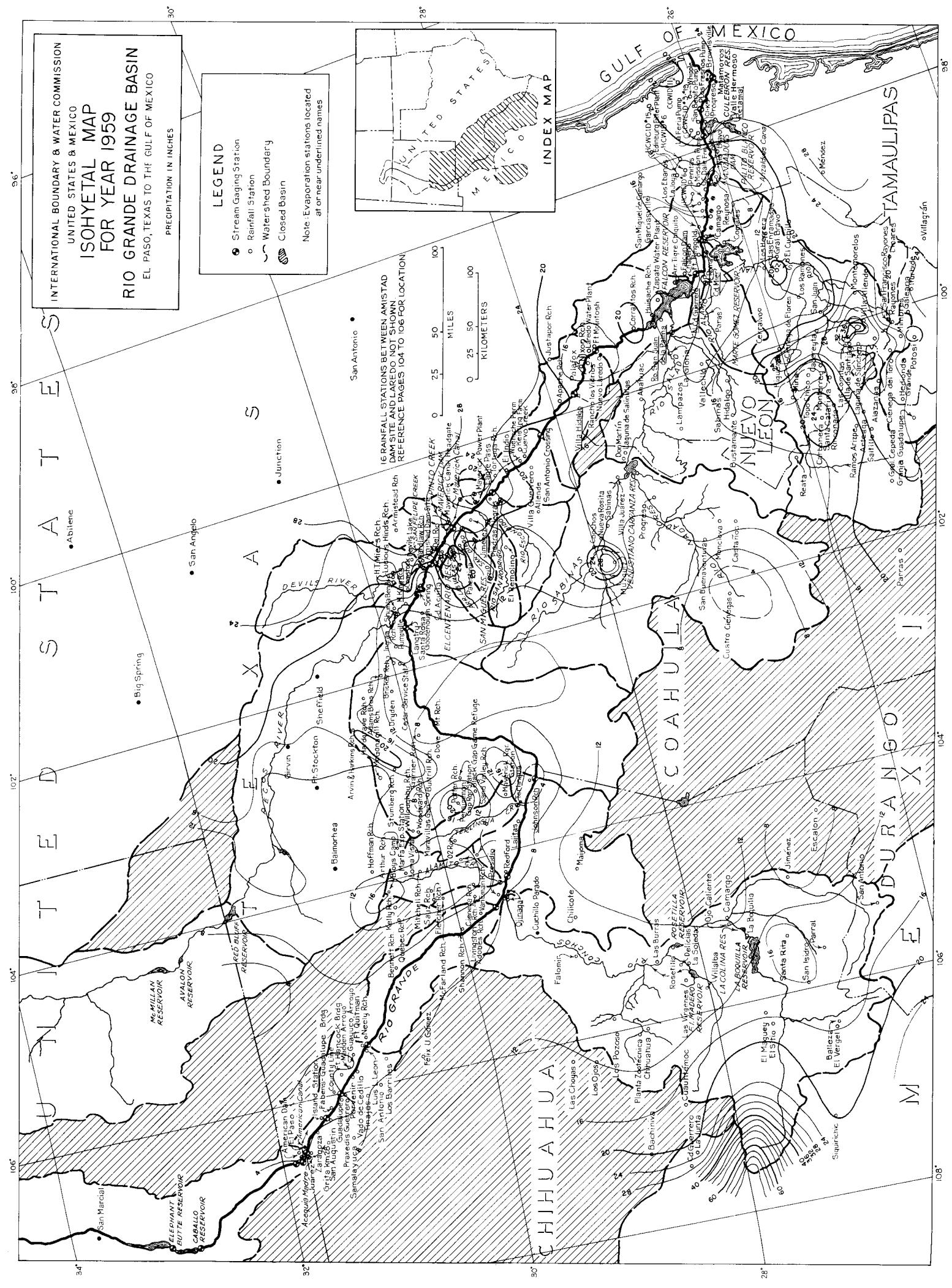
LEGEND

- Stream Gaging Station
 - Rainfall Station
 - ~ Watershed Boundary
 - Closed Basin

Note : Evaporation stations located

•
San Antonio
IONS BETWEEN AMSTAD
REDO NOT SHOWN.

INDEX MAP





**AVERAGE RAINFALL ON SUBDIVISIONS OF THE RIO GRANDE WATERSHED
IN INCHES**

With Averages for the 88 Years 1871-1959, Inclusive

The precipitation records of all stations on or adjacent to the watershed subdivisions listed below have been used, with proper weighting for area, in calculating the average rainfalls shown here. The drainage area for each subdivision is shown in parentheses. The hundreds of individual records are delineated in the various "Indexes to Precipitation Records" shown in Water Bulletins Nos. 10, 14, 22, and 26.

Month	El Paso to Fort Quitman (2,768 Square Miles)		Fort Quitman to Upper Presidio (2,953 Square Miles)		* Upper Presidio to Johnson Ranch (3,886 Square Miles)		Johnson Ranch to Langtry (14,080 Square Miles)	
	1959	Period Average	1959	Period Average	1959	Period Average	1959	Period Average
Jan.	.14	.45	.09	.40	T	.36	.03	.51
Feb.	T	.38	.22	.26	.26	.29	.68	.35
Mar.	.01	.34	0	.26	0	.19	0	.43
Apr.	.06	.29	.35	.38	.53	.42	.82	.80
May	.48	.42	.92	.61	1.02	.77	2.14	1.52
June	.69	.80	1.35	1.19	1.03	1.05	1.89	1.76
July	.81	2.36	.98	3.15	.69	1.80	2.99	1.92
Aug.	1.91	1.97	1.40	2.43	1.08	1.82	1.11	2.19
Sept.	.06	1.38	.43	1.91	.59	1.43	1.55	2.20
Oct.	.86	.94	.98	1.04	.69	.85	1.96	1.21
Nov.	.66	.44	1.04	.40	.51	.34	.98	.61
Dec.	.21	.60	.32	.55	.22	.41	.53	.56
Total	5.89	10.37	8.08	12.58	6.62	9.73	14.68	14.06

Month	Pecos River Below Sheffield (3,519 Square Miles)		# Langtry to Amistad Dam Site (2,014 Square Miles)		Devils River (4,305 Square Miles)		† Amistad Dam Site to Eagle Pass (1,695 Square Miles)	
	1959	Period Average	1959	Period Average	1959	Period Average	1959	Period Average
Jan.	0	.73	.23	.54	.05	.68	.13	.78
Feb.	.87	.90	.54	.63	.88	.67	.60	.90
Mar.	.11	.81	.05	.83	.14	1.14	.06	1.07
Apr.	1.25	1.98	1.17	1.36	1.34	1.80	1.40	1.67
May	3.15	1.82	2.47	2.04	3.22	2.63	3.61	3.01
June	4.44	2.56	4.48	2.28	5.14	2.77	6.02	2.52
July	4.48	1.89	1.89	1.18	3.32	1.76	3.22	1.89
Aug.	.48	2.01	.86	1.62	.99	2.07	.82	1.90
Sept.	.91	2.36	.95	2.26	.83	2.91	1.01	3.07
Oct.	3.27	1.83	3.81	1.39	6.03	2.19	4.24	1.97
Nov.	1.44	.96	.55	.80	1.40	1.63	.97	1.06
Dec.	.94	.78	.64	.66	1.69	1.06	.60	.91
Total	21.34	18.63	17.64	15.59	25.03	21.31	22.68	20.75

Month	⊕ Eagle Pass to Laredo (4,117 Square Miles)		8 Laredo to Falcón Dam (3,394 Square Miles)		↑ Falcón Dam to Rio Grande City (1,166 Square Miles)		United States Side Below Rio Grande City (443 Square Miles)	
	1959	Period Average	1959	Period Average	1959	Period Average	1959	Period Average
Jan.	.48	.77	.78	.77	1.35	.91	1.99	1.24
Feb.	1.15	.81	1.84	.76	2.14	.81	2.54	1.08
Mar.	.02	.99	.04	.85	.14	1.03	.33	1.12
Apr.	1.06	1.58	.53	1.41	.71	1.19	1.52	1.34
May	2.81	3.21	.44	3.31	.29	2.43	1.18	2.81
June	3.35	2.47	4.60	1.84	2.03	2.02	2.95	2.45
July	3.16	1.43	1.93	2.24	1.07	1.99	1.04	1.77
Aug.	1.37	2.33	1.71	1.80	2.00	2.09	1.15	2.25
Sept.	.72	2.96	1.23	2.84	1.95	3.18	.60	4.23
Oct.	3.16	1.82	1.58	1.57	1.69	1.96	3.65	2.52
Nov.	1.03	.98	1.41	1.64	1.49	.74	2.10	1.41
Dec.	.43	1.03	1.41	.82	.18	.64	.40	1.25
Total	18.74	20.38	17.50	19.85	15.04	18.99	19.45	23.47

* Excluding Río Conchos, Alamito and Terlingua Creeks. # Excluding Pecos and Devils Rivers. ↑ Excluding Arroyo las Vacas, San Felipe Creek, Pinto Creek, Río San Diego, and Río San Rodrigo. ⊕ Excluding Río Escondido,

§ Excluding Río Salado above Old Cd. Guerrero. † Excluding Río Alamo and Río San Juan.

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

The precipitation records of stations listed below began on the date shown and extend through 1959. For detailed information regarding sources of data, specific periods of record, and other pertinent matters relative to these and additional rainfall stations on the Rio Grande watershed see "Index to Precipitation Records" in Water Bulletin Nos. 10, 14, 22 and 26.

In the United States

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Adams Bros. Ranch	S	30° 10'	101° 58'	2,150	Apr. 1952	Johnson Ranch - Langtry	George Adams
Adobes Ranch	S	29° 46'	104° 34'	2,550	1950	Fort Quitman - Upper Presidio	T. C. Davis
American Dam	S	31° 47'	106° 32'	3,730	1938	El Paso - Fort Quitman	I. B. & W. C.
Amistad Dam Site	C	29° 25'	101° 02'	980	Oct. 1954	Amistad Dam Site - Eagle Pass	I. B. & W. C.
Apache Ranch	C	27° 56'	99° 56'	500	# 1953	Eagle Pass - Laredo	L. Guardiola
Armistead Ranch	S	29° 35'	100° 39'	1,510	Dec. 1951	Amistad Dam Site - Eagle Pass	Floyd Hodges
Arroyo Tigre Chiquito	C	26° 41'	99° 07'	314	Apr. 1954	Laredo - Falcón Dam	I. B. & W. C.
Arthur, C. L. Ranch	S	30° 23'	103° 45'	4,900	# 1946	Pecos River above Sheffield	C. L. Arthur
Arvin & Harkins - Bean	V	30° 26'	102° 23'	3,100	Nov. 1948	Johnson Ranch - Langtry	Sid Harkins
Arvin & Harkins - Camel	V	30° 25'	102° 20'	2,890	Nov. 1948	Johnson Ranch - Langtry	Sid Harkins
Arvin & Harkins - Header	V	30° 27'	102° 26'	3,400	Nov. 1948	Johnson Ranch - Langtry	Sid Harkins
Arvin & Harkins - HQtrs.	S	30° 27'	102° 20'	2,930	Nov. 1948	Johnson Ranch - Langtry	Sid Harkins
Arvin & Harkins - Monty Corder	V	30° 27'	102° 14'	2,850	Nov. 1948	Johnson Ranch - Langtry	Sid Harkins
Bennett, Moody Ranch	S	30° 37'	104° 52'	3,240	July 1956	Fort Quitman - Upper Presidio	Moody Bennett
Black Gap Game Refuge	S	29° 35'	103° 21'	2,250	1952	Johnson Ranch - Langtry	Tom Moore
Bloys Camp	V	30° 33'	104° 07'	5,650	# 1941	Alamito Creek	George Knight
Bricker Ranch	S	29° 59'	101° 52'	1,680	May 1952	Johnson Ranch - Langtry	Lena Mae Bricker
Buttrill Ranch	S	30° 00'	103° 16'	3,500	Mar. 1952	Johnson Ranch - Langtry	Tom B. Leary
CCWCID #3 (La Feria Dist. Off.) Avg. 6 gages	S	26° 09'	97° 49'	50	1952	Lower Rio Grande Valley	CCWCID #3
CCWD #11 (Bayview Dist. Off.) Avg. 18 gages	S	26° 08'	97° 21'	25	1952	Lower Rio Grande Valley	CCWD #11
CCWCID #19 (Adams Gardens)	S	26° 10'	97° 47'	50	1952	Lower Rio Grande Valley	CCWCID #19
Cedar Service Station	S	29° 55'	101° 55'	1,860	1955	Johnson Ranch - Langtry	Harve Eastman
Chittim Ranch *	C	28° 44'	100° 28'	810	1959	Del Rio - Eagle Pass	I. B. & W. C.
Coal Mine *	R	28° 48'	100° 28'	770	1959	Amistad Dam Site - Eagle Pass	I. B. & W. C.
Comstock	S	29° 41'	101° 11'	1,530	May 1939	Langtry below Amistad Dam Site	George Humphries
Cooper Ranch *	C	28° 50'	100° 27'	800	1959	Amistad Dam Site - Eagle Pass	I. B. & W. C.
Corralitos	C	27° 07'	99° 27'	346	1953	Laredo - Falcón Dam	I. B. & W. C.
County Line	R	31° 23'	105° 59'	3,550	1938	El Paso - Fort Quitman	I. B. & W. C.
Cuervo Creek	C	28° 21'	100° 19'	620	Jan. 1954	Eagle Pass - Laredo	I. B. & W. C.
Dale, O. C. Farm	S	26° 15'	98° 16'	130	1952	Lower Rio Grande Valley	O. C. Dale
Devils Lake	S	29° 34'	100° 59'	1,080	May 1939	Devils River	C. P. & L. Co.
Dove Mountain Ranch	S	29° 49'	102° 53'	2,770	# 1952	Johnson Ranch - Langtry	Sam Cavness
Dryden	S	30° 03'	102° 07'	2,130	# 1931	Johnson Ranch - Langtry	Lewis Cash
Edinburg Filtration Plant	S	26° 18'	98° 10'	100	1952	Lower Rio Grande Valley	City of Edinburg
El Indio	S	28° 31'	100° 19'	725	# 1941	Eagle Pass - Laredo	Glen Stidham
Elm Creek Station *	C	28° 46'	100° 30'	720	1959	Eagle Pass - Laredo	I. B. & W. C.
Fabens-Guadalupe Bridge	S	31° 26'	106° 08'	3,610	Apr. 1940	El Paso - Fort Quitman	I. B. & W. C.
Falcón Dam	S	26° 34'	99° 08'	323	Apr. 1950	Laredo - Falcón Dam	I. B. & W. C.
Farias Ranch *	R	28° 36'	100° 20'	720	1959	Eagle Pass - Laredo	I. B. & W. C.
Fletcher, H. T. Ranch	S	30° 12'	104° 16'	5,100	# 1939	Alamito Creek	Hayes Mitchell, Jr.
Fort Hancock Bridge	S	31° 16'	105° 51'	3,500	Apr. 1940	El Paso - Fort Quitman	I. B. & W. C.
Fort McIntosh (Laredo)	V	27° 30'	99° 31'	410	# 1810	Eagle Pass - Laredo	I. B. & W. C.
Fort Quitman	R	31° 06'	105° 36'	3,430	# 1937	El Paso - Fort Quitman	I. B. & W. C.
Garciasville	R	26° 20'	98° 41'	200	1959	Lower Rio Grande Valley	I. B. & W. C.
Garner Ranch	S	29° 56'	102° 39'	2,600	1949	Johnson Ranch - Langtry	J. Garner
Goodenough Spring	C	29° 32'	101° 13'	1,018	Aug. 1958	Langtry - Amistad Dam Site	I. B. & W. C.
Greenwood, H. M. (Cienega Ranch)	S	29° 48'	104° 13'	4,000	Mar. 1941	Alamito Creek	H. M. Greenwood
Guayuco Arroyo	R	31° 10'	105° 40'	3,600	# May 1940	El Paso - Fort Quitman	I. B. & W. C.
Hardgrave, E. W. Ranch	S	30° 18'	102° 09'	2,650	Apr. 1952	Johnson Ranch - Langtry	Jack Hardgrave
HCWCID #6 (Goodwin Pump #4) Avg. 3 gages	S	28° 18'	98° 22'	185	1953	Lower Rio Grande Valley	HCWCID #6
HCWCID #15 (Edinburg Office)	S	26° 23'	98° 09'	85	1952	Lower Rio Grande Valley	HCWCID #15

Some months or years missing

C Cumulative

R Recording

S Standard

V Visual

* Not shown on map

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In the United States

NAME OF STATION	TYPE GAGE	LATI- TUDE	LONGI- TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
HCWID #6 (Elsa Office) Hinds, Lucius Ranch Hoffman Ranch	S S S	26° 19' 29° 46' 30° 38'	98° 01' 101° 03' 103° 51'	70 1,690 4,650	1952 Sept. 1954 June 1955	Lower Rio Grande Valley Devils River Pecos River above Sheffield	HCWID #6 Lucius Hinds
Huisache Ranch	C	26° 57'	99° 21'	383	Aug. 1953	Laredo - Falcón Dam	Dr. A. J. Hoffman
Ingram Ranch	S	29° 52'	101° 29'	1,580	#Sept. 1954	Pecos River below Sheffield	L. B. & W. C.
Indio Ranch *	S	28° 31'	100° 22'	700	1959	Eagle Pass - Laredo	Arnum Humphries
Island Station	R	31° 32'	106° 14'	3,630	1939	El Paso - Fort Quitman	Barnest Scales
Johnson Ranch	C	29° 01'	103° 23'	2,050	#July 1933	Johnson Ranch - Langtry	L. B. & W. C.
Justapor Ranch	C	27° 53'	99° 27'	720	# 1952	Adjacent to Eagle Pass - Laredo	L. B. & W. C.
Keisling Farm	S	28° 23'	100° 17'	740	Dec. 1958	Eagle Pass - Laredo	Mrs. O. C. Ray
Kelly Ranch	V	30° 32'	104° 16'	5,320	# 1941	Adj. to Alamito Creek	Robert Smith
King, Martin Ranch	R	29° 44'	101° 23'	1,460	Nov. 1954	Langtry - Amistad	George Jones
La Feria Pumping Plant	S	26° 03'	97° 50'	60	1952	Dam Site	L. B. & W. C.
Lajitas *	S	29° 16'	103° 46'	2,400	1959	Upper Presidio - Johnson Ranch	CCWCID #3
La Joya	R	26° 15'	98° 25'	150	Apr. 1957	Lower Rio Grande Valley	Antonio Valenzuela
Laredo Water Plant	S	27° 33'	99° 31'	410	# 1930	Eagle Pass - Laredo	L. B. & W. C.
Las Moras Creek *	S	29° 00'	100° 38'	800	1958	Amistad Dam Site - Eagle Pass	Laredo Water Plant
Lateral No. 2 Spill *	C	28° 56'	100° 38'	760	1959	Del Rio - Eagle Pass	Lou McGee
Lateral No. 12 Headgate *	C	28° 54'	100° 34'	800	1959	Amistad Dam Site - Eagle Pass	I. B. & W. C.
Lateral No. 15 Spill *	C	28° 51'	100° 34'	740	1959	Del Rio - Eagle Pass	I. B. & W. C.
Livingston Ranch	S	29° 49'	104° 22'	4,150	# 1951	Upper Presidio - Johnson Ranch	J. S. Livingston
Loma Vista Ranch	S	30° 13'	103° 47'	5,450	# 1941	Alamito Creek	Hayes Mitchell
Los Ebanos	C	26° 16'	98° 33'	150	Apr. 1957	Lower Rio Grande Valley	L. B. & W. C.
Los Fresnos Pumping Plt.	S	25° 57'	97° 34'	30	1952	Lower Rio Grande Valley	CCWCID #6
Madden Arroyo	R	31° 13'	105° 46'	3,500	Sept. 1941	El Paso - Fort Quitman	L. B. & W. C.
Maravillas Gap Ranch	S	30° 01'	103° 20'	3,520	1956	Johnson Ranch - Langtry	Guy Combs, Jr.
Marfa Experiment Station	S	30° 20'	103° 59'	4,800	1950	Alamito Creek	Dr. G. W. Dollahite
Maverick County Canal Headgate	S	29° 10'	100° 46'	870	Mar. 1948	Amistad Dam Site - Eagle Pass	MCWCID #1
Maverick Power Plant	S	28° 50'	100° 33'	800	June 1952	Amistad Dam Site - Eagle Pass	C. P. & L. Co.
Maverick Ranger Station	S	29° 19'	103° 27'	2,780	Feb. 1955	Upper Presidio - Johnson Ranch	Park Ranger
McFarland Ranch - Cane Pasture	V	30° 03'	104° 15'	5,370	1955	Alamito Creek	C. E. McFarland
McFarland Ranch - Casa Colorado	V	30° 06'	104° 17'	5,330	1955	Alamito Creek	C. E. McFarland
McFarland Ranch - Cement	V	30° 05'	104° 19'	5,470	1955	Alamito Creek	C. E. McFarland
McFarland Ranch - Cocameca	V	30° 08'	104° 16'	5,300	# 1956	Alamito Creek	C. E. McFarland
McFarland Ranch - Deep Well	V	30° 07'	104° 17'	5,470	1955	Alamito Creek	C. E. McFarland
McFarland Ranch - Headquarters	S	30° 06'	104° 16'	5,310	# 1941	Alamito Creek	C. E. McFarland
McFarland Ranch - Punta el Agua	V	30° 02'	104° 13'	5,210	1955	Alamito Creek	C. E. McFarland
McFarland Ranch - Shannon	V	30° 06'	104° 20'	5,480	1955	Alamito Creek	C. E. McFarland
McGonagill Ranch - East Mill	V	30° 20'	102° 55'	4,050	May 1952	Johnson Ranch - Langtry	W. E. McGonagill
McGonagill Rch. - Hqtrs. Miers, H. T. Ranch	S	30° 20'	102° 59'	4,150	Apr. 1952	Johnson Ranch - Langtry	W. E. McGonagill
	V	29° 47'	100° 51'	1,770	1959	Amistad Dam Site - Eagle Pass	H. T. Miers
Mission Pump	S	26° 10'	98° 20'	100	1952	Lower Rio Grande Valley	HCWCID #14
Mitchell, Kerr Ranch	S	30° 13'	104° 00'	4,450	# 1941	Alamito Creek	Mrs. Kerr Mitchell
Neely Ranch	S	30° 59'	105° 32'	3,350	Aug. 1941	Fort Quitman - Upper Presidio	Mrs. Tom Neely
Nixon, J. W. Ranch	S	27° 39'	99° 36'	425	1959	Eagle Pass - Laredo	J. W. Nixon
Normandy *	S	28° 55'	100° 36'	780	1959	Amistad Dam Site - Eagle Pass	Fannin G. Lowe
02 Ranch	S	29° 51'	103° 45'	3,780	# 1914	Terlingua Creek	Cavin Woodward
Penitas (Edinburg Pumping Plant)	S	26° 14'	98° 27'	100	July 1957	Lower Rio Grande Valley	B. Leadbetter
Persimmon Gap Ranger Sta.	S	29° 40'	103° 10'	2,900	# 1948	Johnson Ranch - Langtry	Park Ranger
Pinto Creek *	C	29° 09'	100° 43'	870	1959	Amistad Dam Site - Eagle Pass	I. B. & W. C.
Potter, A. M. Ranch Presidio (I. B. & W. C. Gage)	S	29° 46'	103° 25'	3,440	# 1952	Johnson Ranch - Langtry	A. M. Potter
	C	29° 34'	104° 23'	2,550	Oct. 1949	Upper Presidio - Johnson Ranch	I. B. & W. C.

Some months missing C Cumulative R Recording S Standard V Visual * Not shown on map

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In the United States

NAME OF STATION	TYPE GAGE	LATI-TUDE	LONGI-TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Pumpville	S	29° 57'	101° 44'	1,800	#Oct. 1946	Johnson Ranch - Langtry	Pellum Bradford
Quebec Ranch	V	30° 31'	104° 24'	4,600	1949	Adjacent to Alamito Creek	George Jones
Redford	C	29° 29'	104° 13'	2,500	July 1954	Upper Presidio - Johnson Ranch	I. B. & W. C.
Roma (Internat'l. Bridge)	S	26° 24'	99° 01'	230	1941	Falcón Dam - Rio Grande City	Starr Co. Bridge Co.
Rosita Creek Siphon	C	28° 41'	100° 24'	760	1959	Eagle Pass - Laredo	I. B. & W. C.
Rosita Creek Station *	C	28° 36'	100° 24'	700	1959	Eagle Pass - Laredo	I. B. & W. C.
San Benito Pump	S	26° 03'	97° 45'	50	1933	Lower Rio Grande Valley	I. B. & W. C.
Sand Valley Ranch	S	29° 33'	103° 16'	3,250	# 1952	Johnson Ranch - Langtry	Fred Gullihur
Sauz Ranch	S	30° 10'	104° 12'	4,880	1959	Alamito Creek	Hayes Mitchell
Shannon, Bill Ranch	C	29° 58'	104° 41'	2,750	1959	Fort Quitman - Upper Presidio	Bill Shannon
Shumla Bend	C	29° 50'	101° 25'	1,350	1959	Pecos River below Sheffield	I. B. & W. C.
Stumberg, Steve Ranch	C	30° 11'	102° 53'	4,300	# 1943	Johnson Ranch - Langtry	I. B. & W. C.
Terlingua Creek Station	C	29° 12'	103° 36'	2,260	Mar. 1952	Terlingua Creek	I. B. & W. C.
Tortuga Ranch	C	28° 39'	100° 26'	780	# 1950	Eagle Pass - Laredo	W. H. Brown
Trees Farm *	R	28° 38'	100° 25'	720	1959	Del Rio - Eagle Pass	I. B. & W. C.
Van Dalsem Farm	C	28° 27'	100° 19'	700	1959	Eagle Pass - Laredo	I. B. & W. C.
Van Eman, L. T. Ranch	S	29° 52'	103° 59'	3,890	# 1947	Alamito Creek	L. T. Van Eman
Wardlaw Ranch	R	29° 28'	100° 58'	1,110	Aug. 1955	Devils River	I. B. & W. C.
Whipple Farm	S	26° 04'	97° 29'	25	1952	Lower Rio Grande Valley	Harry Whipple
Wipff *	C	29° 00'	100° 35'	840	1959	Del Rio - Eagle Pass	I. B. & W. C.
Willoughby, Ray Ranch	S	30° 12'	103° 33'	5,050	1952	Johnson Ranch - Langtry	Cliff St. Clair
Woodward, J. F. Ranch	S	30° 08'	103° 36'	4,750	1954	Johnson Ranch - Langtry	J. F. Woodward
Wuensche Farm	S	28° 24'	100° 19'	670	# 1952	Eagle Pass - Laredo	I. B. & W. C.
Zapata Water Plant	S	26° 54'	99° 16'	380	May 1953	Laredo - Falcón Dam	Zapata Water Plant

Some months or years missing C Cumulative R Recording S Standard V Visual * Not shown on map

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In Mexico

NAME OF STATION	TYPE GAGE	LATI- TUDE	LONGI- TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
A. Blanca Canoas, Nuevo León	†	25° 30'	100° 28'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Adjuntas, Nuevo León	†	25° 18'	100° 10'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Allende, Coahuila	S	28° 21'	100° 51'	1,170	# 1947	Río Salado	Hydr. Resources
Anahdac, Nuevo León	S	27° 15'	100° 07'	650	June 1933	Río Salado	Hydr. Resources
Arteaga, Coahuila	†	25° 27'	100° 50'	†	1958	Río San Juan	Meteor. Service of Mexico
Bachiniva, Chihuahua	†	28° 48'	107° 15'	6,250	1952	Adjacent to Río Conchos	Meteor. Service of Chihuahua
Balleza, Chihuahua	S	26° 57'	106° 21'	5,870	# 1903	Río Conchos	Meteor. Service of Mexico
Bustamante, Nuevo León	†	26° 32'	100° 31'	†	1958	Río Salado	Hydr. Resources
Cadereyta, Nuevo León	S	25° 36'	99° 59'	1,180	#Sept. 1904	Río San Juan	Hydr. Resources
Camargo, Chihuahua	†	27° 42'	105° 10'	3,950	Oct. 1956	Río Conchos	Meteor. Service of Chihuahua
Camargo, Tamaulipas	S	26° 20'	98° 49'	175	# 1953	Río San Juan	Hydr. Resources
Canadá, Nuevo León	†	25° 45'	100° 18'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Carbonera, Nuevo León	†	25° 49'	100° 47'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Casillas, Nuevo León	†	25° 11'	100° 12'	†	# 1958	Río San Juan	Hydr. Resources
Castanitos, Coahuila	S	26° 47'	101° 27'	2,440	#Oct. 1932	Río Salado	Hydr. Resources
Cd. Acuña, Coahuila	S	29° 19'	100° 56'	919	1951	Amistad Dam-Eagle Pass	I. B. & W. C.
Cd. Guerrero, Chihuahua	S	28° 33'	107° 30'	6,560	#May 1903	Adjacent to Río Conchos	Meteor. Service of Mexico
Cd. Mier, Tamaulipas	S	26° 26'	99° 09'	260	Oct. 1955	Laredo - Falcón	I. B. & W. C.
Cerralvo, Nuevo León	R	26° 06'	99° 37'	1,120	#Nov. 1938	Río San Juan	Hydr. Resources
Cerritos, Nuevo León	†	25° 31'	100° 11'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Cerro Prieto, Nuevo León	†	†	†	†	May 1958	Río San Juan	Hydr. Resources
Chihuahua, Chihuahua	S	28° 38'	106° 04'	4,690	# 1900	Río Conchos	Meteor. Service of Mexico
Chilicote, Chihuahua	†	28° 59'	104° 48'	†	# 1955	Río Conchos	Meteor. Service of Chihuahua
Clénega del Toro, Nuevo León	†	25° 05'	100° 21'	†	1958	Adjacent to Río San Juan	Monterrey Wtr.Wks.
Clénega, Nuevo León	†	25° 21'	100° 14'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Clénega la Purísima, Coahuila	†	25° 20'	100° 29'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Clénega de Flores, Nuevo León	R	25° 58'	100° 10'	1,760	Apr. 1938	Río San Juan	Hydr. Resources
Comales, Tamaulipas	R	26° 11'	98° 55'	270	#Mar 1938	Río San Juan	Hydr. Resources
Conchos, Coahuila	†	28° 00'	101° 19'	†	#Oct. 1950	Río Salado	Hydr. Resources
Control (C1-K-9), Tamaulipas	S	25° 58'	97° 49'	59	#June 1942	Lower Rio Grande Valley	Hydr. Resources
Cuatro Clíenegas, Coahuila	S	27° 00'	102° 05'	2,430	#June 1923	Río Salado	Hydr. Resources
Cuauhtémoc, Chihuahua	S	28° 24'	106° 52'	7,250	#June 1923	Adjacent to Río Conchos	Hydr. Resources
Delicias, Chihuahua	S	28° 11'	105° 31'	3,710	#Aug. 1933	Río Conchos	Hydr. Resources
Don Martín, Coahuila	S	27° 33'	100° 37'	790	#June 1927	Río Salado	Hydr. Resources
El Cuchillo, Nuevo León	S	25° 43'	99° 16'	590	June 1938	Río San Juan	Hydr. Resources
El Maguey, Chihuahua	†	27° 35'	106° 07'	†	July 1955	Río Conchos	Meteor. Service of Chihuahua
El Remolino, Coahuila	S	28° 45'	101° 05'	1,350	June 1958	Amistad Dam-Eagle Pass	I. B. & W. C.
El Sítio, Chihuahua	†	27° 31'	106° 14'	†	July 1955	Río Conchos	Meteor. Service of Chihuahua
El Vergel, Chihuahua	†	26° 22'	106° 30'	†	1957	Río Conchos	Meteor. Service of Chihuahua
Escalón, Chihuahua	†	26° 45'	104° 21'	†	1957	Adjacent to Río Conchos	Meteor. Service of Chihuahua
Félix U. Gómez (Los Lamentos, Chihuahua)	†	30° 35'	105° 50'	4,920	1955	Adjacent to Ft. Quitman	Meteor. Service of Chihuahua
Galeana, Nuevo León	†	24° 50'	100° 04'	†	# 1958	to Upper Presidio	Meteor. Service of Chihuahua
Garita Km. 28, Chihuahua	S	31° 34'	106° 28'	3,990	May 1958	Adjacent to Río San Juan	Meteor. Service of Mexico
Gral. Bravo, Nuevo León	S	25° 48'	99° 09'	394	#Sept. 1906	Río San Juan	I. B. & W. C.
Gral. Cepeda, Coahuila	S	25° 24'	101° 29'	4,920	Aug. 1926	Río San Juan	Hydr. Resources
Granjito Guadalupe, Coahuila	†	25° 03'	101° 01'	†	1958	Adjacent to Río San Juan	Hydr. Resources
Guadalupe, Chihuahua	S	31° 23'	106° 06'	3,580	1958	El Paso - Ft. Quitman	I. B. & W. C.
Hedionda Grande, Coahuila	†	25° 06'	100° 50'	†	1958	Adjacent to Río San Juan	Monterrey Wtr.Wks.
Higueras, Nuevo León	S	25° 59'	100° 01'	1,640	#Sept. 1906	Río San Juan	Meteor. Service of Mexico
Huasteca Parshall, Nuevo León	†	25° 40'	100° 26'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Icamole, Nuevo León	†	25° 44'	100° 46'	†	1958	Río San Juan	Hydr. Resources
Iurbide, Nuevo León	†	24° 44'	99° 53'	†	1941	Adjacent to Río San Juan	Hydr. Resources
Jagüey, Nuevo León	†	25° 39'	100° 22'	†	1958	Río San Juan	Private Gage
Jiménez, Chihuahua	†	27° 08'	104° 55'	4,490	# 1951	Río Conchos	Meteor. Service of Chihuahua
Jiménez, Coahuila	S	29° 04'	100° 40'	814	1951	Amistad Dam-Eagle Pass	I. B. & W. C.
Juárez, Chihuahua	S	31° 44'	106° 29'	3,740	† 1903	El Paso - Ft. Quitman	Hydr. Resources
Kilometro 140, Nuevo León	†	25° 56'	98° 43'	492	#June 1958	Adj. to Falcon-R. G. City	I. B. & W. C.

* Some months missing

† Some years and months missing

‡ Not available

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LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In Mexico

NAME OF STATION	TYPE GAGE	LATI- TUDE	LONGI- TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
La Boquilla, Chihuahua	S	27° 32'	105° 25'	4,330	# 1910	Río Conchos	Río Conchos Hydroelectric Co.
La Cruz, Nuevo León	†	25° 29'	100° 21'	†	1958	Río San Juan	Hydr. Resources
La Gloria, Nuevo León	S	26° 54'	99° 48'	427	May 1958	Adjacent to Laredo-Falcón	I. B. & W. C.
La Junta, Chihuahua	S	28° 26'	107° 20'	6,730	# 1925	Adjacent to Río Conchos	Hydr. Resources
La Peña de San Cristóbal, Nuevo León	†	25° 24'	100° 19'	†	1958	Río San Juan	Monterrey Wtr.Wks.
La Popa, Nuevo León	†	26° 10'	100° 50'	†	1958	Río San Juan	Hydr. Resources
La Soledad, Chihuahua	†	28° 09'	105° 29'	†	# 1956	Río Conchos	Meteor. Service of Chihuahua
Laguna de Salinillas, Nuevo León	S	27° 32'	100° 34'	750	# 1940	Río Salado	Hydr. Resources
Laguna de Sánchez, Nuevo León	R	25° 21'	100° 16'	6,500	Apr. 1941	Río San Juan	Hydr. Resources
Lampazos, Nuevo León	†	27° 00'	100° 30'	†	1958	Río Salado	Meteor. Service of Mexico
Las Burras, Chihuahua	†	28° 27'	105° 26'	3,590	July 1949	Río Conchos	Hydr. Resources
Las Choyas, Chihuahua	†	29° 18'	106° 11'	†	# 1955	Adjacent to Río Conchos	Meteor. Service of Chihuahua
Las Comitas, Nuevo León	S	25° 26'	100° 09'	1,670	1940	Río San Juan	Hydr. Resources
Las Enramadas, Nuevo León	S	25° 48'	99° 16'	730	#Sept. 1926	Río San Juan	Hydr. Resources
Las Norias, Coahuila	†	29° 12'	102° 19'	†	May 1959	Johnson Ranch - Langtry	Hydr. Resources
Las Peñas, Nuevo León	†	25° 14'	100° 02'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Las Virgenes, Chihuahua	S	28° 10'	105° 38'	4,070	# 1943	Río Conchos	Hydr. Resources
Linares, Nuevo León	R	24° 52'	99° 34'	1,180	# 1900	Adjacent to Río San Juan	Hydr. Resources
Los Angeles, Coahuila	S	29° 30'	101° 40'	1,800	May 1959	Langtry - Del Rio	E. Escandon
Los Barriles, Chihuahua	S	30° 55'	105° 45'	4,860	July 1958	Adjacent to El Paso - Fort Quitman	I. B. & W. C.
Los Herrera, (La Tableta), Nuevo León	R	25° 55'	99° 24'	820	Sept. 1939	Río San Juan	Hydr. Resources
Los Ojos, Chihuahua	†	29° 06'	106° 15'	†	1957	Adjacent to Río Conchos	Meteor. Service of Chihuahua
Los Pozos, Chihuahua	†	28° 53'	106° 02'	†	# 1956	Río Conchos	Meteor. Service of Chihuahua
Los Ramones, Nuevo León	R	25° 42'	99° 38'	262	#Sept. 1939	Río San Juan	Hydr. Resources
Luis L. León Chihuahua	S	31° 05'	105° 37'	3,460	Apr. 1958	El Paso - Ft. Quitman	I. B. & W. C.
Maclovio Herrera (Palomir), Chihuahua	S	29° 03'	105° 08'	3,380	# 1924	Río Conchos	Meteor. Service of Mexico
Manzano, Nuevo León	†	25° 21'	100° 12'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Matamoros, Tamaulipas	†	25° 52'	97° 30'	33	# 1958	Lower Rio Grande Valley	Hydr. Resources
Maijoma, Chihuahua	†	28° 54'	104° 20'	†	Aug. 1955	Río Conchos	Meteor. Service of Chihuahua
Mederos, Nuevo León	†	25° 35'	100° 17'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Méndez, Tamaulipas	S	25° 07'	98° 35'	420	#Sept. 1939	Adjacent to Lower Rio Grande Valley	Hydr. Resources
Mimbres, Nuevo León	†	24° 58'	100° 16'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Mina, Nuevo León	†	26° 00'	100° 31'	†	1958	Río San Juan	Hydr. Resources
Mirador, Nuevo León	†	25° 33'	100° 18'	†	1958	Río San Juan	Private Gage
Monclova, Coahuila	S	26° 54'	101° 25'	1,940	# 1897	Río Salado	Meteor. Service of Mexico
Montemorelos, Nuevo León	S	25° 12'	99° 50'	1,420	#Aug. 1904	Río San Juan	Hydr. Resources
Monterrey, Nuevo León	S	25° 40'	100° 18'	1,740	# 1896	Río San Juan	Hydr. Resources
Morteros, Nuevo León	†	25° 38'	100° 27'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Muzquiz, Coahuila	S	27° 52'	101° 31'	1,650	# 1923	Río Salado	Meteor. Service of Mexico
Noria, Nuevo León	†	25° 38'	100° 10'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Nueva Cd. Guerrero, Tamaulipas	S	26° 34'	99° 14'	348	#May 1954	Laredo - Falcón	I. B. & W. C.
Nuevo Laredo, Tamaulipas	S	27° 29'	99° 31'	420	1950	Laredo - Falcón	L. B. & W. C.
Nuevo Laredo, Tamaulipas	S	27° 29'	99° 31'	413	# 1909	Laredo - Falcón	Meteor. Service of Mexico
Nueva Rosita, Coahuila	S	27° 56'	101° 13'	1,410	#Aug. 1925	Río Salado	Meteor. Service of Mexico
Ojinaga, Chihuahua	S	29° 33'	104° 28'	2,580	#Apr. 1954	Río Conchos	I. B. & W. C.
Ojinaga, Chihuahua	S	29° 34'	104° 26'	2,620	#Nov. 1906	Río Conchos	Meteor. Service of Mexico
Ojo Caliente, Chihuahua	S	27° 41'	105° 13'	4,010	1942	Río Conchos	Hydr. Resources
Pajonal, Nuevo León	+	25° 29'	100° 25'	†	1958	Río San Juan	Hydr. Resources
Palestina, Coahuila	S	29° 08'	100° 57'	1,080	# 1931	Amistad Dam - Eagle Pass	Hydr. Resources
Paraiso, Nuevo León	†	25° 14'	100° 04'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Parás, Nuevo León	†	26° 30'	99° 31'	†	# 1958	Adjacent to Laredo - Falcón	Hydr. Resources
Parral, Chihuahua	S	26° 56'	105° 39'	5,740	# 1903	Río Conchos	Meteor. Service of Mexico
Parras, Coahuila	†	25° 27'	102° 10'	5,510	1958	Adjacent to Río San Juan	Hydr. Resources
Piedras Negras, Coahuila	S	28° 42'	100° 31'	721	# 1951	Amistad Dam Site - Eagle Pass	I. B. & W. C.
Planta Zootécnica, Chihuahua	†	28° 41'	106° 04'	†	# 1957	Río Conchos	Meteor. Service of Chihuahua

Some months missing † Some years and months missing † Not available R Recording S Standard

LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

In Mexico

NAME OF STATION	TYPE GAGE	LATI- TUDE	LONGI- TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUEDIVISION	OBSERVER
Porvenir, Chihuahua	S	31° 52'	105° 52'	3,530	1958	El Paso - Ft. Quitman	I. B. & W. C.
Potosí, Nuevo León	†	24° 51'	100° 19'	†	1958	Adjacent to Río San Juan	Monterrey Wtr.Wks.
Potero Abrejo, Coahuila	†	25° 17'	100° 18'	†		Río San Juan	Hydr. Resources
Potero Redondo, Nuevo León	†	25° 16'	100° 08'	†	# 1958	Río San Juan	
Praxedes G. Guerrero, Chihuahua	S	31° 22'	106° 00'	3,560	1958	El Paso - Ft. Quitman	I. B. & W. C.
Presas Estanzuela, Nuevo León	†	25° 33'	100° 17'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Progreso, Coahuila	S	27° 25'	101° 00'	1,210	Feb. 1943	Río Salado	Hydr. Resources
Puerto de la Camotera, Nuevo León	†	25° 15'	100° 11'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Puerto Gringo, Nuevo León	†	25° 24'	100° 12'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Puerto Mauricio Arriba, Nuevo León	†	25° 20'	100° 10'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Raíces, Nuevo León	†	25° 15'	100° 01'	†	# 1958	Río San Juan	Monterrey Wtr.Wks.
Ramos Arizpe, Coahuila	S	25° 32'	100° 57'	4,590	#Apr. 1907	Río San Juan	Meteor. Service of Mexico
Rancho los Vidrios, Tamaulipas	S	27° 36'	99° 37'	466	Sept. 1956	Eagle Pass - Laredo	H. Vidrio
Rancho San Diego, Coahuila	†	27° 59'	100° 35'	†	May 1959	Eagle Pass - Laredo	
Rancho San Jesus, Coahuila	†	28° 02'	100° 01'	545	June 1958	Eagle Pass - Laredo	
Rancho San Juan de la Palma, Tamaulipas	S	26° 53'	99° 22'	348	Apr. 1955	Laredo - Falcón	I. B. & W. C.
Rayones, Nuevo León	S	25° 01'	100° 05'	1,970	#Oct. 1926	Río San Juan	Hydr. Resources
Reata, Coahuila	S	26° 07'	101° 04'	3,070	#July 1944	Río San Juan	Hydr. Resources
Retamal, Tamaulipas	S	26° 02'	98° 02'	82	Oct. 1949	Lower Rio Grande Valley	I. B. & W. C.
Reynosa, Tamaulipas	R	26° 06'	98° 17'	130	# 1941	Lower Rio Grande Valley	Hydr. Resources
Reynosa, Tamaulipas	†	26° 06'	98° 17'	†	1959	Lower Rio Grande Valley	I. B. & W. C.
Rinconada, Nuevo León	S	25° 40'	100° 40'	4,790	Apr. 1944	Río San Juan	Hydr. Resources
Río Bravo, Tamaulipas	S	26° 00'	98° 06'	85	#Sept. 1950	Lower Rio Grande Valley	Hydr. Resources
Rodeo, Nuevo León	†	25° 35'	100° 27'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Rosetilla, Chihuahua	S	28° 14'	105° 19'	3,780	1940	Río Conchos	Río Conchos Hydro electric Co.
Rusio, Nuevo León	†	24° 42'	100° 32'	†	1959	Río San Juan	Monterrey Wtr.Wks.
Sabinal, Nuevo León	†	25° 26'	100° 05'	†	1959	Río San Juan	Monterrey Wtr.Wks.
Sabinas, Coahuila	S	27° 50'	101° 08'	1,440	#May 1922	Río Salado	Hydr. Resources
Sabinas Hidalgo, Nuevo León	S	26° 30'	100° 11'	1,030	May 1958	Río Salado	I. B. & W. C.
Saltillo, Coahuila	S	25° 26'	101° 00'	5,280	# 1886	Río Conchos	Hydr. Resources
Samalayuca, Chihuahua	†	31° 21'	106° 28'	4,180	1958	El Paso - Ft. Quitman	Meteor. Service of Mexico
San Agustín, Chihuahua	S	31° 31'	106° 15'	3,650	1958	El Paso - Ft. Quitman	I. B. & W. C.
San Antonio de las Alazanas, Coahuila	†	25° 15'	100° 36'	†	1958	Río San Juan	Hydr. Resources
San Antonio, Chihuahua	S	31° 01'	106° 00'	4,500	July 1958	El Paso - Ft. Quitman	I. B. & W. C.
San Antonio, Durango	S	26° 25'	105° 21'	5,430	1943	Río Conchos	Hydr. Resources
San Buenaventura, Coahuila	S	27° 05'	101° 33'	2,300	#Dec. 1926	Río Salado	Meteor. Service of Mexico
San Francisco Rayones, Nuevo León	†	25° 03'	100° 07'	†	1958	Río San Juan	Monterrey Wtr.Wks.
San Isidro, Chihuahua	†	27° 46'	106° 49'	†	Aug. 1957	Río Conchos	Meteor. Service of Chihuahua
San Juan, Nuevo León	†	25° 33'	99° 50'	876	Nov. 1943	Río San Juan	Hydr. Resources
San Juanito, Chihuahua	†	27° 59'	107° 36'	†	1959	Río Conchos	Meteor. Service of Chihuahua
San Miguel de Camargo, Tamaulipas	S	26° 14'	98° 36'	130	# 1953	Lower Rio Grande Valley	Hydr. Resources
San Nicolás, Nuevo León	†	25° 44'	100° 17'	†	# 1958	Río San Juan	Private Gage
San Pablo, Nuevo León	†	25° 34'	100° 19'	†	1958	Río San Juan	Monterrey Wtr.Wks.
San Rafael, Nuevo León	†	25° 01'	100° 32'	†	1959	Río San Juan	Monterrey Wtr.Wks.
Santa Catarina, Nuevo León	R	25° 41'	100° 26'	1,970	Oct. 1937	Río San Juan	Hydr. Resources
Santa Rita, Chihuahua	†	27° 15'	105° 28'	†	# 1956	Río Conchos	Meteor. Service of Chihuahua
Santa Rosa, Coahuila	†	29° 38'	101° 28'	†	# 1958	Langtry-Amistad Dam	Valeriano T.Diego
Siquiriche, Chihuahua	†	27° 09'	107° 12'	†	July 1956	Adjacent to Río Conchos	Meteor. Service of Chihuahua
Tinajas, Chihuahua	S	31° 09'	106° 05'	4,210	1958	El Paso - Ft. Quitman	I. B. & W. C.
Topo Chico, Nuevo León	R	25° 49'	100° 20'	1,640	#Aug. 1939	Río San Juan	Hydr. Resources
Túnel San Francisco, Nuevo León	†	25° 25'	100° 10'	†	1958	Río San Juan	Monterrey Wtr.Wks.
Vado de Cedillos, Chihuahua	S	31° 12'	105° 49'	3,500	Apr. 1958	El Paso - Ft. Quitman	I. B. & W. C.
Vallecillo, Nuevo León	†	26° 40'	99° 58'	†	June 1958	Río Salado	Hydr. Resources
Valle Hermoso, Tamaulipas	S	25° 41'	97° 48'	56	#June 1949	Lower Rio Grande Valley	Hydr. Resources
Villa Alende, Nuevo León	S	25° 17'	100° 01'	2,210	#Nov. 1938	Río San Juan	Hydr. Resources
Villa de Santiago, Nuevo León	S	25° 25'	100° 07'	1,480	# 1923	Río San Juan	Hydr. Resources
Villa Guerrero, Coahuila	S	28° 20'	100° 24'	689	June 1958	Eagle Pass - Laredo	I. B. & W. C.
Villa Hidalgo, Coahuila	S	27° 47'	99° 52'	499	1951	Eagle Pass - Laredo	Hydr. Resources
Villa Juárez, Coahuila	S	27° 37'	100° 44'	900	# 1943	Río Salado	Hydr. Resources
Villa La Bala, Chihuahua	S	28° 01'	105° 46'	3,940	Oct. 1940	Río Conchos	Hydr. Resources
Zaragoza, Chihuahua	†	31° 40'	106° 20'	3,660	Feb. 1958	El Paso - Ft. Quitman	Hydr. Resources

Some months missing † Not available R Recording S Standard

**EVAPORATION IN THE RIO GRANDE BASIN
IN INCHES
In the United States**

Tabulated below are records of evaporation observed at six stations operated by the United States Section of this Commission from Presidio to Brownsville, Texas. At all stations, the exposure to wind was uniform and relatively unimpeded. The sites were kept cleared of all high brush and trees within 150 feet, and all brush, tall weeds and other obstructions within 100 feet of the fenced enclosures. Within the enclosures, all vegetation has been either eradicated or kept trimmed to within 3 inches of the ground surface. For specific location of these stations refer to data opposite same station name shown in "Location of Rainfall Stations on the Rio Grande Watershed", pages 104 to 106 in this bulletin.

Records were obtained by means of:

1. U. S. Weather Bureau Standard Pan. A circular pan, 4 feet in diameter and 10 inches deep, made of 22-gage galvanized iron, is set on a wooden platform with the rim of the pan 16 inches above the ground. The water level is maintained between 2 and 3 inches below the rim of the pan. This type of pan was in operation at Falcon Dam, Texas.

2. A circular pan, 2 feet in diameter and 36 inches deep, made of 22-gage galvanized iron, is set in the ground with the rim of the pan 3 inches above the ground surface and the top covered with a circular screen of No. 4 (1 1/4" mesh) galvanized hardware cloth. The water level is maintained between 2.5 and 3.5 inches below the rim of the pan. This type of pan was in operation at Falcon Dam, Texas. This same type of pan, equipped with an automatic feed tank that maintains the water at a level 3 inches below the rim of the pan, was in operation at Martin King Ranch and Wardlaw Ranch.

3. A circular pan, 12 feet in diameter and 36 inches deep, made of 30-gage galvanized iron, is set in the ground with the rim of the pan 3 inches above the ground surface. The water level is maintained between 2.5 and 3.5 inches below the rim of the pan.

An evaporometer developed by the United States Section of this Commission and calibrated against a 2-foot pan, described above, was in operation at Presidio, Johnson Ranch and Brownsville, 7 miles east.

Month	Presidio, Texas		Johnson Ranch, Texas		Martin King Ranch		Wardlaw Ranch	
	1959	Average 1950-1959	1959	Average 1950-1959	1959	Average March 1956-1959	1959	Average Sept. 1955-1959
Jan.	2.80	3.72	2.98	4.03	3.26	3.12	2.74	3.01
Feb.	4.60	5.13	3.56	5.45	2.91	3.22	2.99	3.38
Mar.	7.80	8.58	7.63	8.65	6.66	6.28	6.27	6.14
Apr.	8.79	10.56	9.05	10.80	6.64	7.50	5.84	6.69
May	10.90	12.86	10.72	12.94	8.03	9.00	6.79	7.90
June	11.92	13.93	10.86	13.82	9.65	11.42	8.25	9.45
July	11.10	13.18	13.09	14.61	9.56	12.36	8.47	12.49
Aug.	10.97	13.03	11.50	13.27	8.05	12.40	8.63	11.90
Sept.	9.91	11.19	9.93	10.92	9.17	8.37	8.69	7.90
Oct.	6.52	8.10	6.55	8.44	5.46	5.91	5.26	5.76
Nov.	4.67	5.23	3.88	5.26	4.09	3.87	4.11	4.27
Dec.	3.21	3.57	2.90	3.86	3.38	3.40	2.73	3.00
Total	93.19	109.08	92.65	112.05	76.86	86.85	70.77	81.89

Month	Falcon Dam, Texas					Brownsville, Texas	
	2-Foot Pan		4-Foot Pan		12-Foot Pan		
	1959	Average April 1950-1959	1959	Average April 1956-1959	1959	Average April 1956-1959	1959
Jan.	2.01	3.88	3.18	3.99	2.22	2.91	1.67
Feb.	2.15	4.82	3.03	4.63	2.16	3.36	1.24
Mar.	4.83	7.11	7.05	8.21	5.02	5.81	1.09
Apr.	5.58	8.14	8.18	9.82	5.38	6.35	2.84
May	10.04	10.30	13.52	13.48	7.12	8.47	3.83
June	9.21	11.52	13.30	13.59	7.38	9.12	4.47
July	11.31	13.57	15.94	17.06	9.54	11.92	5.60
Aug.	10.56	12.21		16.57	9.99	11.44	4.64
Sept.	8.47	8.60	11.75	11.08	8.55	8.08	6.67
Oct.	6.20	6.80	8.01	8.26	5.98	5.79	4.84
Nov.	4.75	5.14	5.47	5.90	4.20	4.28	3.07
Dec.	3.58	4.18	4.65	4.68	3.18	3.39	2.58
Total	78.69	96.21		117.27	70.72	80.92	42.54

EVAPORATION IN THE RIO GRANDE BASIN
IN INCHES
In Mexico

Tabulated below are records of evaporation observed at nine stations operated and maintained by the Mexican Section of this Commission. Eight stations are along the Rio Grande from Cd. Acuña, Coahuila to Retamal, Tamaulipas and one is located on the Río Conchos near Ojinaga, Chihuahua. At all stations, except Ojinaga, the sites were kept cleared of all high brush and trees within 150 feet, and of all brush and tall weeds within 100 feet of the fenced enclosures. There are several large trees at the Ojinaga station. The corrugated iron gage well, 42 inches in diameter, and one A-frame of the cableway of the Río Conchos stream gaging station are in the north end of the enclosure. Inside the enclosures, all vegetation had been eradicated or was kept trimmed to within 3 inches of the ground surface. Except for a water barrel and a thermometer shelter in the northeast and northwest corners of the enclosures, the exposure to wind was uniform and relatively unimpeded. For specific location of these stations refer to data opposite same station name shown in "Location of Rainfall Stations on the Rio Grande Watershed", pages 107 through 109 in this bulletin.

The type of pan used at all these stations was a U.S. Weather Bureau Standard Pan, 4-feet in diameter and 10 inches deep, made of 22-gage galvanized iron, set on a wooden platform with the rim of the pan 16 inches above the ground. The water level was maintained between 2 and 3 inches below the rim of the pan and was measured with a micrometer gage.

Data for other evaporation stations in the Rio Grande Basin in Mexico, which were operated by various Mexican agencies, are available in Water Bulletin Number 29 published by the Mexican Section of this Commission.

Month	Ojinaga, Chih.		Cd. Acuña, Coah.		Jiménez, Coah.		Piedras Negras, Coah.		Hidalgo, Coah.	
	1959	#Average April 1954-1959	1959	Average 1951-1959	1959	#Average 1951-1959	1959	#Average 1951-1959	1959	Average 1951-1959
Jan.	2.95	2.97	2.80	3.63	2.56	3.23	3.29	3.32	3.07	4.45
Feb.	3.94	4.20	3.11	4.83	2.52	4.30	4.22	4.50	2.87	5.55
Mar.	7.25	6.85	8.98	8.20	7.34	7.05	6.65	7.22	7.01	8.70
Apr.	7.45	8.97	7.23	9.21	6.39	8.01	8.22	8.70	7.96	10.66
May	10.86	11.28	8.56	10.39	8.46	9.55	8.56	9.81	12.57	13.24
June	11.20	12.18	10.56	12.05	9.84	11.34	10.43	11.57	13.53	14.68
July	9.81	11.68	9.96	13.55	9.30	12.77	11.86	13.71	13.54	16.85
Aug.	9.50	9.74	10.77	12.65	9.86	11.66	9.94	12.77	12.78	15.70
Sept.	7.06	7.98	8.97	9.11	8.61	8.09	8.54	8.46	11.24	11.01
Oct.	5.25	5.70	5.81	6.15	5.61	5.61	5.56	6.30	7.04	7.86
Nov.	3.27	3.49	3.80	3.97	3.65	3.52	3.49	3.66	4.44	5.00
Dec.	2.56	2.73	3.59	3.51	3.40	3.14	3.24	3.15	3.61	4.34
Total	81.10	87.77	84.14	97.25	77.54	88.27	84.00	93.17	99.66	118.04

Month	Rancho San Juan de la Palma, Tamps.		Nueva Cd. Guerrero, Tamps.		Cd. Mier, Tamps.		Retamal, Tamps.	
	1959	Average April 1955-1959	1959	#Average June 1954-1959	1959	Average Oct. 1955-1959	1959	Average 1951-1959
Jan.	3.42	4.05	2.70	3.91		3.87	3.26	4.51
Feb.	3.46	4.80	2.30	3.98	3.00	4.67		5.09
Mar.	6.32	7.04	6.19	7.00	6.97	7.56	5.98	6.67
Apr.	8.55	9.44	7.56	8.96	6.27	8.48	7.41	8.31
May	13.56	11.89	11.47	11.86	11.65	11.45		9.29
June	11.63	12.95	11.87	11.86	13.45	13.14	8.27	9.41
July	13.49	15.43	12.74	14.20	15.48	16.15	10.52	10.07
Aug.	14.17	14.99	12.07	13.46	14.46	15.32	11.09	10.24
Sept.	12.62	11.02	10.61	10.18	12.87	12.09	9.86	7.42
Oct.	7.33	7.77	6.66	7.32	8.31	9.09	6.77	6.05
Nov.	5.12	5.00	4.89	5.40	4.78	5.14	3.83	4.17
Dec.	4.67	4.26	4.20	4.11	4.79	4.46	4.31	4.01
Total	104.34	108.64	93.26	102.24		111.42		85.24

Some months missing

TEMPERATURE, HUMIDITY, AND WIND

The mean monthly temperatures shown for the stations in Mexico are averages of daily maximum and minimum thermometer observations.

The mean monthly temperatures and relative humidities shown for stations in the United States were integrated from continuous records of hygrothermographs, housed in louvered shelters, with the sensing elements of the instruments 16 inches above the ground and 9 feet southwest of either a 2 or 4-foot diameter evaporation pan.

Monthly mean wind velocities are based on the total miles of wind movement indicated by a standard 3-cup anemometer installed and operated according to specifications for a Class A Weather Bureau evaporation station.

Mean Temperature - Degrees Fahrenheit In the United States

Month	Tortuga Ranch, Texas		Falcón Dam, Texas	
	1959	Average June 1955-1959	1959	Average July 1950-1959
Jan.	50.2	51.2	51.5	58.9
Feb.	55.0	56.2	55.2	62.1
Mar.	62.6	62.2	61.7	68.1
Apr.	68.6	69.2	68.7	74.8
May	80.0	78.5	81.2	80.5
June	84.8	85.5	82.7	84.9
July	85.5	86.4	84.8	86.6
Aug.	87.8	87.3	84.8	86.8
Sept.	84.9	81.1	83.1	82.4
Oct.	73.4	71.2	73.8	74.4
Nov.	54.3	57.2	58.9	63.3
Dec.	55.0	52.9	58.4	58.9
Yearly	70.2	69.9	70.4	73.5

In Mexico

Month	Ojinaga, Chihuahua		Cd. Acuña, Coahuila		Jimenez, Coahuila		El Remolino, Coahuila	
	1959	#Avg. Apr. 1954-1959	1959	Avg. Apr. 1951-1959	1959	#Avg. Mar. 1954-1959	1959	Avg. June 1958-1959
Jan.	50.4	49.0	48.6	52.4	49.1	53.7	51.1	
Feb.	53.6	54.1	53.6	57.3	55.2	58.4	60.6	
Mar.	57.4	58.8	61.7	63.8	60.4	63.7	62.6	
Apr.	67.1	67.9	68.2	72.1		71.6	66.0	
May	77.0	76.6	79.9	79.5	79.2	77.8	77.4	
June	83.5	84.0	85.3	86.1	83.8	84.4	80.8	82.0
July	82.9	84.7	85.5	88.6	83.8	86.6	83.1	83.8
Aug.	83.8	82.7	87.3	89.2	85.8	86.8	81.3	83.6
Sept.	79.2	78.6	84.4	83.3	83.3	80.9	82.4	80.4
Oct.	70.2	68.2	73.2	72.4	72.7	71.9	76.5	71.2
Nov.	54.7	55.0	53.8	58.3	55.6	59.5	56.5	57.3
Dec.	48.7	49.2	52.5	52.5	55.9	54.2	55.2	54.0
Yearly	67.4	67.4	69.5	71.3		70.8	69.5	

X

Month	Piedras Negras, Coahuila		Villa Guerrero, Coahuila		Villa Hidalgo, Coahuila		Rancho San Juan de la Palma, Tamps.	
	1959	#Avg. Apr. 1951-1959	1959	Avg. July 1958-1959	1959	#Avg. Aug. 1951-1959	1959	Avg. Apr. 1955-1959
Jan.	46.4	51.3	46.8		52.3	56.0	55.0	58.3
Feb.	54.3	55.9	54.1		55.8	59.0	58.6	62.3
Mar.	57.4	60.9	59.7		62.6	65.8	64.8	64.1
Apr.	63.3	68.8	64.8		70.2	74.1	72.7	72.7
May	76.6	76.4	77.7		83.1	80.3	85.1	82.4
June	81.1	83.6	80.6		85.6	86.3	86.7	87.3
July	84.6	86.1	82.8	83.0	86.7	87.4	89.1	88.6
Aug.	85.3	86.1	83.5	84.4	87.6	87.7	88.9	89.6
Sept.	83.5	79.4	81.3	80.2	86.2	82.8	87.6	85.6
Oct.	70.9	68.0	71.1	68.1	76.3	74.1	79.5	76.4
Nov.	54.9	55.8	53.8	56.3	61.2	60.9	65.5	64.8
Dec.	55.9	52.0	53.6	49.6	57.9	56.8	62.1	60.0
Yearly	67.8	68.7	67.5		72.1	72.6	74.6	74.3

* Some months missing

TEMPERATURE, HUMIDITY, AND WIND

Mean Temperature - Degrees Fahrenheit
In Mexico

Month	Nueva Cd. Guerrero, Tamaulipas		Cd. Mier, Tamaulipas		Retamal, Tamaulipas		K. 140 Nuevo Leon	
	1959	Average 1958-1959	1959	#Avg. Oct. 1955-1959	1959	Average 1951-1959	1959	Average
Jan.	52.2	53.0		59.9	55.9	63.2		
Feb.	56.3	56.3		64.2	59.7	64.7		
Mar.	63.7	62.2		68.5	65.5	70.8	65.8	Record began March 1959
Apr.	71.1	72.6		77.4	72.0	77.2	71.6	
May	83.7	81.4	82.9	82.7	82.8	81.5	81.9	
June	85.6	84.6	84.7	87.0	82.8	85.7	82.6	
July	87.1	86.8	86.5	88.2	85.6	86.9	85.6	
Aug.	86.9	87.6	86.5	88.8	86.9	88.3	86.0	
Sept.	85.1	83.8	84.7	84.5	85.6	83.5	83.1	
Oct.	75.9	72.5	77.4	77.2	77.4	76.6	79.9	
Nov.	60.1	62.4	61.2	63.8	61.2	66.8	67.1	
Dec.	59.2	56.4	59.4	61.5	64.4	63.0	61.2	
Yearly	72.2	71.6		75.3	73.3	75.7		

Mean Relative Humidity-Percent**In the United States**

Month	Tortuga Ranch, Texas		Falcón Dam, Texas	
	1959	Average June 1955-1959	1959	Average July 1950-1959
Jan.	75.4	75.8	75.7	64.3
Feb.	81.1	74.8	83.5	63.9
Mar.	53.6	60.4	63.1	59.5
Apr.	68.2	66.2	66.1	60.2
May	71.0	69.0	62.3	62.6
June	64.8	64.3	65.0	63.3
July	63.2	61.7	60.3	58.6
Aug.	59.4	60.2	61.4	59.1
Sept.	60.0	68.6	60.8	64.3
Oct.	66.4	70.0	66.0	64.4
Nov.	61.7	71.1	62.8	63.7
Dec.	59.7	65.9	61.6	60.5
Yearly	65.4	67.3	65.7	62.0

Mean Wind Speed - Miles Per Hour**In the United States**

Martin King Ranch		Falcón Dam, Texas	
1959	Average 1957-1959	1959	Average July 1950-1959
5.0	4.8	3.7	4.1
4.7	5.1	3.7	4.8
6.8	7.7	4.4	5.4
6.4	6.9	4.1	6.1
7.6	7.0	5.7	6.3
6.7	7.7	4.9	6.7
7.1	7.9	5.3	7.0
6.8	6.9	5.5	6.0
6.9	6.1	4.2	4.6
4.7	4.8	3.6	4.0
3.8	4.2	3.4	4.1
5.0	4.3	3.1	3.8
6.0	6.1	4.3	5.2

DRAINAGE BASIN AND IRRIGATED AREAS

Along the Rio Grande and Tributaries - 1959

The total area within the outer rim of the Rio Grande Basin is about 335,500 square miles; however, in many places, particularly along the southwestern boundary of the basin, large areas contribute no surface runoff to the Rio Grande. Such non-contributive areas constitute about 45.7% of the total area, leaving 182,215 square miles of productive watershed. Only the productive part of the watershed is included in the list below.

The irrigated areas shown below are from the most reliable sources available and are listed according to the downstream sequence of the points of diversion of their irrigation water and, consequently, they may or may not be wholly within the indicated main river or tributary reach. They are all within the Rio Grande Basin, except in the Lower Rio Grande Valley below the Rio Grande City gaging station, where water is diverted at numerous points to irrigate lands which are adjacent to but do not contribute surface runoff to the Rio Grande.

DESIGNATIONS OF AREAS AND GAGING STATIONS	Drainage Basin Square Miles			Irrigated Areas—Acres		
	United States	Mexico	Total	United States	Mexico	Total
Above Elephant Butte Dam	25,923	0	25,923			
Elephant Butte Dam to Caballo Dam	1,295	0	1,295	0	0	0
Above Caballo Dam	27,218	0	27,218	0	0	0
Caballo Dam to El Paso Station	2,049	0	2,049	94,202	0	94,202
Above El Paso Gaging Station	29,267	0	29,267	94,202	0	94,202
El Paso Station to American Dam	4	0	4	14,759	0	14,759
Above American Dam	29,271	0	29,271	108,961	0	108,961
American Dam to Island Station	187	493	680	35,272	22,086	57,358
Above Island Gaging Station	29,458	493	29,951	144,233	22,086	166,319
Island Station to County Line Station	485	174	659	0	0	0
American Dam to County Line Station - Total	672	667	1,339	35,272	22,086	57,358
Above County Line Gaging Station	29,943	667	30,610	144,233	22,086	166,319
County Line Station to Fort Quitman Station	663	762	1,425	7,142	0	7,142
Above Fort Quitman Gaging Station	30,606	1,429	32,035	151,375	22,086	173,461
Fort Quitman to Upper Presidio Station	1,621	1,332	2,953	1,356	494	1,850
Above Upper Presidio Gaging Station	32,227	2,761	34,988	152,731	22,580	175,311
Rfo Conchos Above Boquilla Dam	0	8,202	8,202	0	4,942	4,942
Rfo Conchos Below Boquilla Dam	0	21,065	21,065	0	181,100	181,100
Rfo Conchos - Total	0	29,267	29,267	0	186,042	186,042
Alamito Creek above Gaging Station	1,504	0	1,504	70	0	70
Upper Presidio to Lower Presidio Gaging Station - excluding above tributaries	367	77	444	1,987	507	2,494
Upper Presidio to Lower Presidio - Total	1,871	29,344	31,215	2,057	186,549	188,606
Above Lower Presidio Gaging Station	34,098	32,105	66,203	154,788	209,129	363,917
Terlingua Creek above Gaging Station	1,070	0	1,070	0	0	0
Lower Presidio to Johnson Ranch Station - excluding Terlingua Creek	1,093	2,349	3,442	966	3,180	4,146
Lower Presidio to Johnson Ranch - Total	2,163	2,349	4,512	966	3,180	4,146
Above Johnson Ranch Gaging Station	36,261	34,454	70,715	155,754	212,309	368,063
Johnson Ranch Station to Langtry Station	6,594	7,486	14,080	a 4,081	0	4,081
Above Langtry Gaging Station	42,855	41,940	84,795	T59,835	212,309	372,144
Pecos River above Girvin	29,562	0	29,562			
Pecos River, Girvin to Shumla Station	5,600	0	5,600	150	0	150
Pecos River - Total	35,308	0	35,308	150	0	150
Goodenough Spring above Gaging Station	1	0	1	0	0	0
Devils River above Upper Devils Station	3,903	0	3,903	0	0	0
Devils River above Devils River Station	4,185	0	4,185	0	0	0
Devils River - Above Station near Mouth	4,305	0	4,305	0	0	0
Langtry Station to Below Amistad Dam Site Station - excluding above tributaries	221	1,793	2,014	0	0	0
Langtry Station to Below Amistad Dam Site Station - Total	39,835	1,793	41,628	150	0	150
Above the Below Amistad Dam Site Gaging Station	82,690	43,733	126,423	159,985	212,309	372,294

^a Includes 3,690 acres irrigated by spreader dams.

DRAINAGE BASIN AND IRRIGATED AREAS

Along the Rio Grande and Tributaries - 1959

DESIGNATIONS OF AREAS AND GAGING STATIONS	Drainage Basin Square Miles			Irrigated Areas—Acres		
	United States	Mexico	Total	United States	Mexico	Total
Arroyo las Vacas above Gaging Station	0	358	358	0	1,236	1,236
San Felipe Creek above Gaging Station	46	0	46	2,272	0	2,272
Below Amistad Dam Site Station to Below Maverick Dam - excluding above tributaries	627	210	837	33,077	1,786	34,863
Below Amistad Dam Site Station to Below Maverick Dam - Total	673	568	1,241	35,349	3,022	38,371
Above the Below Maverick Dam Gaging Station	83,363	44,301	127,664	195,334	215,331	410,665
Pinto Creek above Gaging Station	249	0	249	125	0	125
Río San Diego above Gaging Station	0	848	848	0	12,325	12,325
Río San Diego - Total	0	856	856	0	13,032	13,032
Río San Rodrigo above Gaging Station	0	669	669	0	5,313	5,313
Río San Rodrigo - Total	0	958	958	0	5,313	5,313
Maverick Dam Station to Maverick Power Plant - excluding above tributaries	389	181	570	300	0	300
Maverick Dam Station to Maverick Power Plant - Total	638	1,995	2,633	425	18,345	18,770
Above Maverick Power Plant	84,001	46,296	130,297	195,759	233,676	429,435
Maverick Power Plant to Eagle Pass Station	244	34	278	180	4,005	4,185
Above Eagle Pass Gaging Station	84,245	46,330	130,575	195,939	237,681	433,620
Río Escondido above Gaging Station	0	1,279	1,279	0	10,502	10,502
Río Escondido - Total	0	1,284	1,284	0	10,502	10,502
Eagle Pass Station to San Antonio Crossing Station - excluding Río Escondido	237	251	488	300	1,070	1,370
Eagle Pass to San Antonio Crossing Station - Total	237	1,535	1,772	300	11,572	11,872
Above San Antonio Crossing Gaging Station	84,482	47,865	132,347	196,239	249,253	445,492
San Antonio Crossing to Palafox Station	629	1,949	2,578	1,300	6,766	8,066
Above Palafox Gaging Station	85,111	49,814	134,925	197,539	256,019	453,558
Palafox Station to Laredo Station	607	444	1,051	2,707	9,086	11,793
Above Laredo Gaging Station	85,718	50,258	135,976	200,246	265,105	465,351
Río Salado above Venustiano Carranza Dam	0	17,296	17,296	0	58,811	58,811
Río Salado above Las Tortillas Gaging Station	0	24,877	24,877	0	137,074	137,074
Río Salado above Cd. Guerrero Gaging Station	0	25,112	25,112	0	137,074	137,074
Laredo Station to Falcón Dam - excluding Río Salado	2,042	1,352	3,394	b. 7,111	10,821	17,932
Laredo Station to Falcón Dam - Total	2,042	26,464	28,506	7,111	147,895	155,006
Above Falcón Dam Gaging Station	87,700	76,722	164,482	207,357	413,000	620,357
Río Alamo above Gaging Station	0	1,692	1,692	0	7,660	7,660
Río San Juan above Marte Gómez Dam	0	13,429	13,429	0	102,548	102,548
Río San Juan - Marte Gómez to Camargo Gaging Station	0	172	172	0	161,087	161,087
Río San Juan - Total	0	13,601	13,601	0	263,635	263,635
Falcón Dam Station to Fort Ringgold Station - excluding above tributaries	222	399	621	9,237	5,320	14,557
Falcón Dam Station to Fort Ringgold - Total	222	15,692	15,914	9,237	276,615	285,852
Above Fort Ringgold Gaging Station	87,982	92,414	180,396	216,594	689,615	906,209
Fort Ringgold Station to Anzalduas Dam Site	952	790	1,742	185,176	485,582	670,758
Above Anzalduas Dam Site	88,934	93,204	182,138	401,770	1,175,197	1,576,967
Anzalduas Dam Site to Progreso Station	13	22	35	141,213	3,467	144,680
Above Progreso Gaging Station	88,947	93,226	182,173	542,983	1,178,664	1,721,647
Progreso Station to San Benito Station	7	7	14	330,097	193	330,290
Above San Benito Gaging Station	88,954	93,233	182,187	873,080	1,178,857	2,051,937
San Benito Station to Lower Brownsville Station	14	14	28	101,023	170	101,193
Fort Ringgold Station to Lower Brownsville Station	986	833	1,819	757,509	489,412	1,246,921
Above Lower Brownsville Gaging Station	88,968	93,247	182,215	974,103	1,179,027	2,153,130
Lower Brownsville Station to Gulf of Mexico Above Gulf of Mexico				6,268	52	6,320
				980,371	1,179,079	2,159,450

^b Excludes 65 acres irrigated from small reservoirs

SUPPLEMENTARY DATA—INTERNATIONAL FALCON RESERVOIR

Deduced Inflows

Considering that a knowledge of the mean daily inflows reaching the International Falcón Reservoir would serve a useful purpose, such data have been deduced for 1959 showing the flows as close as they can be approximated. These data are based on the daily operation of the International Falcón Reservoir, taking into account: a) record of gage heights at the dam; b) releases as measured at both hydroelectric plants and outlet works; c) elevation-area-capacity tables based on 1956 surveys; and d) rate of evaporation measured at the dam and at Nueva Cd. Guerrero applied to an area one foot higher than the average area of two consecutive days.

Flow contributions from different sources, irrigation diversions between Laredo and Falcón, river channel losses, reservoir evaporation, accuracy of gage-height records, displacement due to wind action on the reservoir, and back storage and return incident to changes in reservoir level, all tend to cause variations in the deduced determinations and the inflows shown below should not necessarily be in agreement with the combined flow of the Rio Grande at Laredo and the Río Salado at Las Tortillas.

In spite of the deficiencies noted above and others that may occur, the data shown below represent a reasonable approximation of the daily flows entering the International Falcón Reservoir.

Mean Daily Discharge in Second-Feet 1959 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,840	8,400	2,590	1,640	611	1,130	3,090	2,910	5,160	2,080	6,990	2,210
2	6,460	3,810	4,270	2,780	2,980	2,780	3,200	2,990	7,660	1,510	2,910	1,930
3	6,890	8,510	4,100	4,940	1,780	671	2,720	2,870	8,440	6,220	3,210	2,340
4	4,730	6,670	3,810	357	4,410	2,770	3,440	2,160	6,530	19,210	5,190	2,540
5	7,240	6,360	5,260	3,140	5,300	3,960	3,670	2,570	5,470	13,600	2,690	1,460
6	5,400	3,600	3,670	2,420	1,340	9,360	3,670	3,330	7,380	18,290	1,070	2,330
7	3,920	3,880	3,640	1,540	2,930	3,960	3,210	2,480	11,270	27,580	1,780	1,670
8	4,700	4,380	4,130	3,880	3,640	5,010	4,520	2,740	9,250	12,540	2,850	2,470
9	3,290	3,530	2,290	1,170	1,730	6,000	4,130	2,710	8,090	7,590	2,100	2,650
10	7,270	3,810	3,780	2,840	5,160	4,130	3,810	2,320	9,460	6,600	1,920	2,660
11	6,460	2,900	3,190	2,740	4,380	3,260	2,960	1,920	5,230	3,640	2,750	3,230
12	5,010	3,290	2,100	3,200	1,290	3,220	3,030	2,340	3,810	3,570	2,370	1,430
13	4,480	4,800	2,700	773	1,900	3,140	4,170	1,920	4,270	8,050	4,100	1,560
14	4,340	5,090	3,570	1,900	2,580	3,850	3,100	1,100	4,450	3,410	1,550	2,200
15	7,770	4,170	3,810	2,760	1,880	2,600	3,460	2,260	4,130	3,920	1,760	2,840
16	1,110	5,090	1,910	1,930	2,110	2,750	2,710	2,800	3,180	7,840	3,130	1,750
17	4,410	6,460	925	2,320	2,190	2,790	2,310	1,570	3,710	5,400	2,040	2,490
18	2,300	6,290	1,230	2,950	2,660	1,670	1,860	1,840	2,690	1,370	2,000	2,820
19	5,400	6,320	1,470	2,460	2,750	1,280	4,200	2,090	2,680	3,990	1,010	1,850
20	4,100	6,320	5,120	2,650	6,600	1,430	7,200	2,320	3,110	3,200	3,780	2,380
21	3,810	3,850	2,550	3,570	3,080	1,240	7,700	1,960	2,640	2,420	2,880	2,300
22	4,450	2,250	1,390	600	4,060	1,440	17,090	2,770	2,580	2,770	2,510	2,670
23	3,670	2,980	1,750	2,180	3,960	706	18,050	2,280	2,510	3,380	2,570	2,040
24	5,470	4,520	2,440	2,620	4,560	2,350	11,090	5,650	3,230	2,840	2,430	1,480
25	3,740	4,480	5,050	2,420	2,260	12,930	7,520	5,970	2,890	2,390	2,220	2,470
Sum	131,660	89,635	70,121	92,491	136,277	154,890	98,150	189,550	147,090	79,550	70,810	
	142,650											

Current Year 1959

Month	Extreme Gage Feet		Ø Extreme Second-Feet		Average Second-Feet	Total	Acre-Feet		
	High	Low	Day	Day	Acres	Acres	Average	Maximum	Minimum
Jan.			15	7,770	16	1,110	4,600	283,000	
Feb.			3	8,510	27	2,100	4,700	261,200	
Mar.			5	5,260	17	925	2,890	177,800	
Apr.			3	4,940	4	357	2,340	139,100	
May			20	6,600	1	611	2,980	183,400	
June			27	24,540	3	671	4,540	270,300	
July			23	18,050	18	1,860	5,000	307,300	
Aug.			29	6,220	14	1,100	3,170	194,700	
Sept.			7	11,270	27	2,450	4,900	291,800	
Oct.			7	27,580	18	1,370	6,110	375,900	
Nov.			1	6,990	19	1,010	2,650	157,800	
Dec.			31	3,270	29	1,230	2,280	140,500	
Yearly				27,580		357	3,840	2,782,800	

Ø Mean daily